HEAT CONTROLLER, INC.

Wall Mounted
Multi-Zone Split System
Air Conditioning/Heat Pump

Service Manual

Model: Indoor Unit: B-MMC09FA-1
B-MMH09FA-1
B-MMC12FA-1
B-MMH12FA-1

Outdoor Unit : A-MMC18FA-1
A-MMH18FA-1
A-MMC24FA-1
A-MMH24FA-1
A-MMC36FA-1
A-MMH36FA-1

CAUTION

Before servicing the unit, read the "safety precautions" in this manual.

Only for authorized service personnel.

TABLE OF CONTENTS

Combination table

18 kBtu/h(2 rooms)

	Combination		
	Indoor Unit A(kBtu/h)	Indoor Unit B(kBtu/h)	Total(kBtu/h)
2 Indoor Units	9	9	18

24 kBtu/h(2 rooms)

	Combination		
	Indoor Unit A(kBtu/h)	Indoor Unit B(kBtu/h)	Total(kBtu/h)
2 Indoor Units	12	12	24

36 kBtu/h (3 rooms)

	Combination			
	Indoor Unit A(kBtu/h)	Indoor Unit B(kBtu/h)	Indoor Unit C(kBtu/h)	Total(kBtu/h)
3 Indoor Units	12	12	12	36

Notes :
1.Cooling Capacity is based on : indoor temp. 26.7°C(80.1°F)DB, 19.4°C(66.9°F)WB; outdoor temp. 35°C(95°F)DB, 23.9°C(75°F)WB
2.Heating Capacity is based on : indoor temp. 21.1°C(70°F)DB, 15.6°C(60.1°F)WB; outdoor temp. 8.3°C(46.9°F)DB, 6.1°C(43°F)WB

This symbol alerts you to the risk of electric shock.

This symbol alerts you to hazards that could cause harm to the air conditioner.

NOTICE **This symbol indicates special notes.**

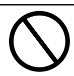
Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

⚠WARNING	This symbol indicates the possibility of death or serious injury.
⚠CAUTION	This symbol indicates the possibility of injury or damage to properties only.

■ Meanings of symbols used in this manual are as shown below.

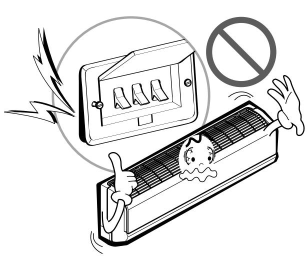
	**Be sure not to do.**
	**Be sure to follow the instruction.**

⚠WARNING

■ Installation

Do not use a defective or under-rated circuit breaker. Use this appliance on a dedicated circuit.

• There is risk of fire or electric shock.



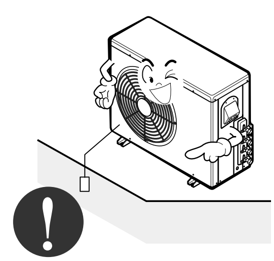
For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.

• Do not disassemble or repair the product. There is risk of fire or electric shock.



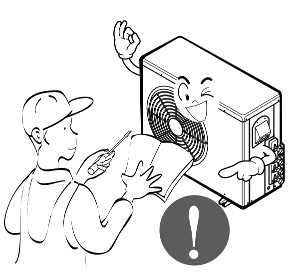
Always ground the product.

• There is risk of fire or electric shock.



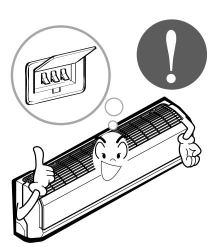
Install the panel and the cover of control box securely.

• There is risk of fire or electric shock.



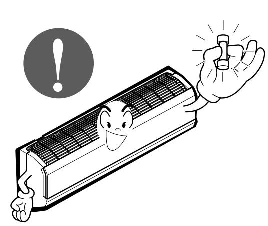
Always install a dedicated circuit and breaker.

• Improper wiring or installation may cause fire or electric shock



Use the correctly rated breaker or fuse.

• There is risk of fire or electric shock.



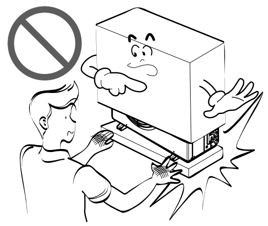
Do not install, remove, or re-install the unit by yourself (customer).

- There is risk of fire, electric shock, explosion, or injury.



Be cautious when unpacking and installing the product.

- Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.



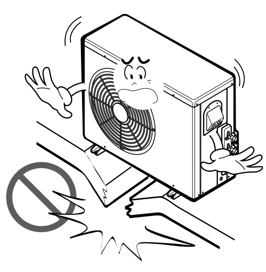
For installation, always contact the dealer or an Authorized Service Center.

- There is risk of fire, electric shock, explosion, or injury.



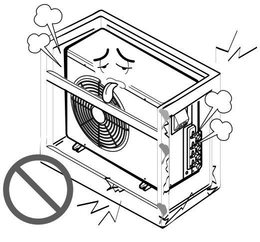
Do not install the product on a defective installation stand.

- It may cause injury, accident, or damage to the product.



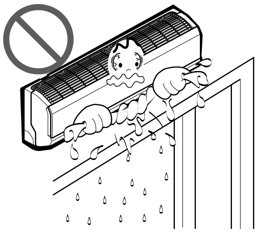
Be sure the installation area does not deteriorate with age.

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.



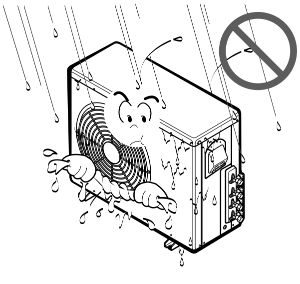
Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

- Moisture may condense and wet or damage furniture.



Do not allow water to run into electric parts.

- It may cause There is risk of fire, failure of the product, or electric shock.



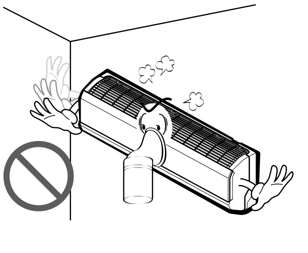
Do not store or use flammable gas or combustibles near the product.

- There is risk of fire or failure of product.



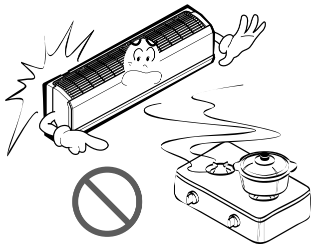
Do not use the product in a tightly closed space for a long time.

- Oxygen deficiency could occur.



When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.

• Do not use the telephone or turn switches on or off. There is risk of explosion or fire



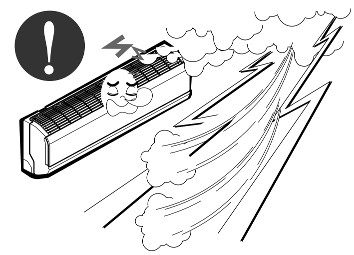
If strange sounds or smoke come from the product, turn the breaker off.

• There is risk of electric shock or fire.



Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.

• There is risk of property damage, failure of product, or electric shock.



Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

• There is risk of physical injury, electric shock, or product failure.



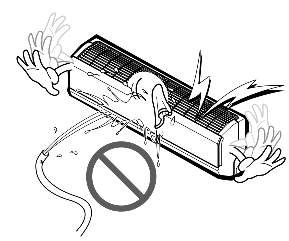
When the product is soaked (flooded or submerged), contact an Authorized Service Center.

• There is risk of fire or electric shock.



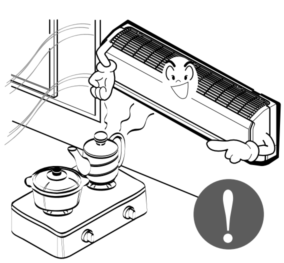
Be cautious that water can never enter the product.

• There is risk of fire, electric shock, or product damage.



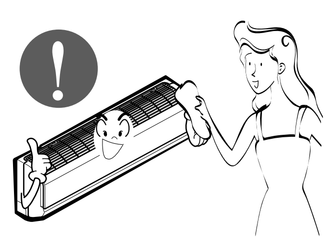
Ventilate the product from time to time when operating it together with a stove, etc.

• There is risk of fire or electric shock.



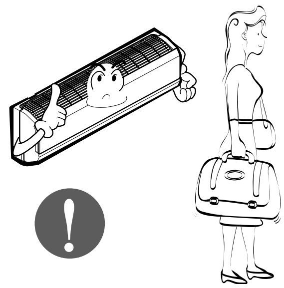
Turn the main power off when cleaning or maintaining the product.

• There is risk of electric shock.



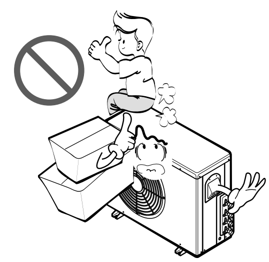
When the product is not being used for a long time, disconnect the power by turning off the breaker.

- There is risk of product damage or failure, or unintended operation.



Take care to ensure that nobody could step on or fall onto the outdoor unit.

- This could result in personal injury and product damage.

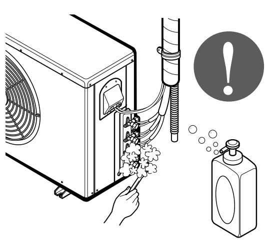


⚠ CAUTION

■ Installation

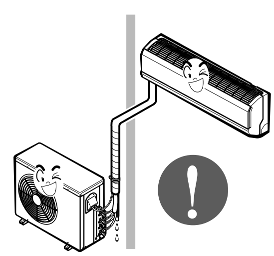
Always check for gas (refrigerant) leakage after installation or repair of product.

- Low refrigerant levels may cause failure of product.



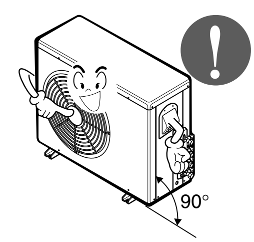
Install the drain hose to ensure that water is drained away properly.

- A bad connection may cause water leakage.



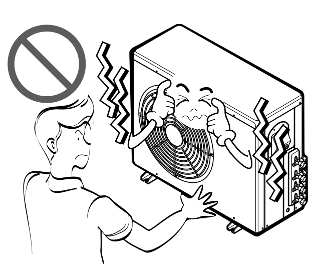
Keep level even when installing the product.

- To avoid vibration or water leakage.



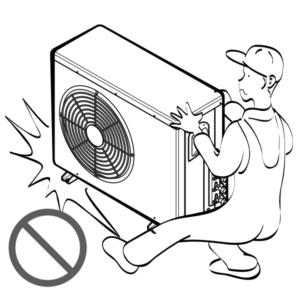
Do not install the product where the noise or hot air from the outdoor unit could offend neighbors.

- It may cause a problem for your neighbors.



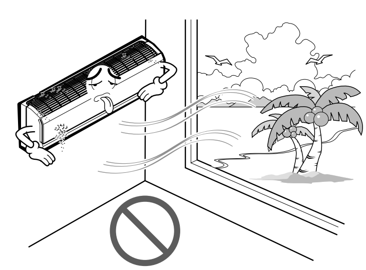
Use two or more people to lift and transport the product.

- Avoid personal injury.



Do not install the product where it will be exposed to sea wind (salt spray) directly.

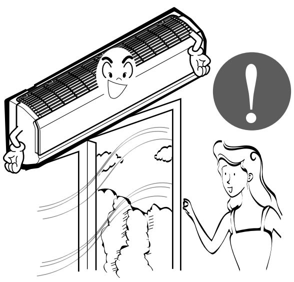
- It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.



■ Operational

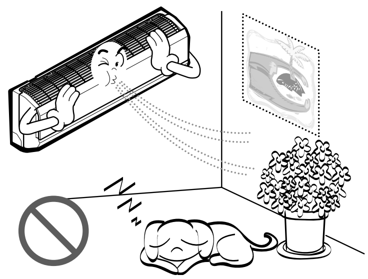
Do not expose the skin directly to cool air for long periods of time. (Don't sit in the draft.)

- This could harm to your health.



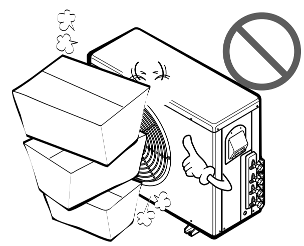
Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigeration system.

- There is risk of damage or loss of property.



Do not block the inlet or outlet of air flow.

- It may cause product failure.



Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.

- There is risk of fire, electric shock, or damage to the plastic parts of the product.



Do not touch the metal parts of the product when removing the air filter. They are very sharp!

- There is risk of personal injury.



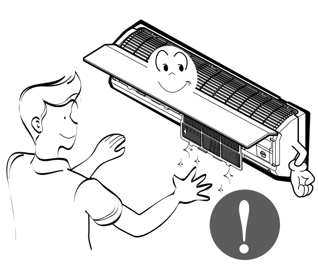
Do not step on or put anyting on the product. (outdoor units)

- There is risk of personal injury and failure of product.



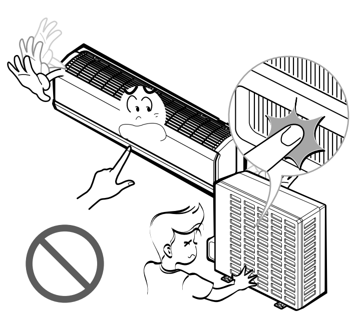
Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

- A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.



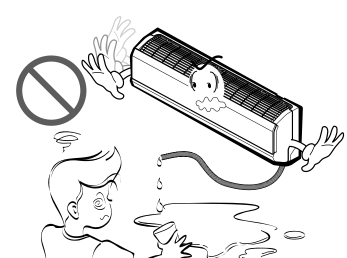
Do not insert hands or other objects through the air inlet or outlet while the product is operating.

- There are sharp and moving parts that could cause personal injury.



Do not drink the water drained from the product.

- It is not sanitary and could cause serious health issues.



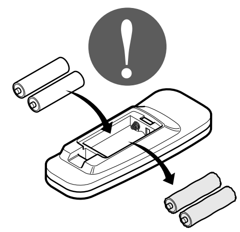
Use a firm stool or ladder when cleaning or maintaining the product.

• Be careful and avoid personal injury.



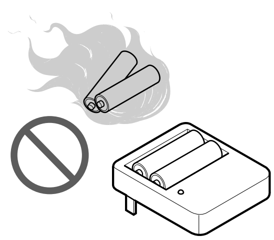
Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.

• There is risk of fire or explosion



Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

• They may burn or explode.



If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.

• The chemicals in batteries could cause burns or other health hazards.



**If you ingest the liquid from the batteries, call your local poison control center or a doctor.
Do not use the remote is the batteries have leaked.**

• The chemicals in batteries could cause burns or other health hazards.



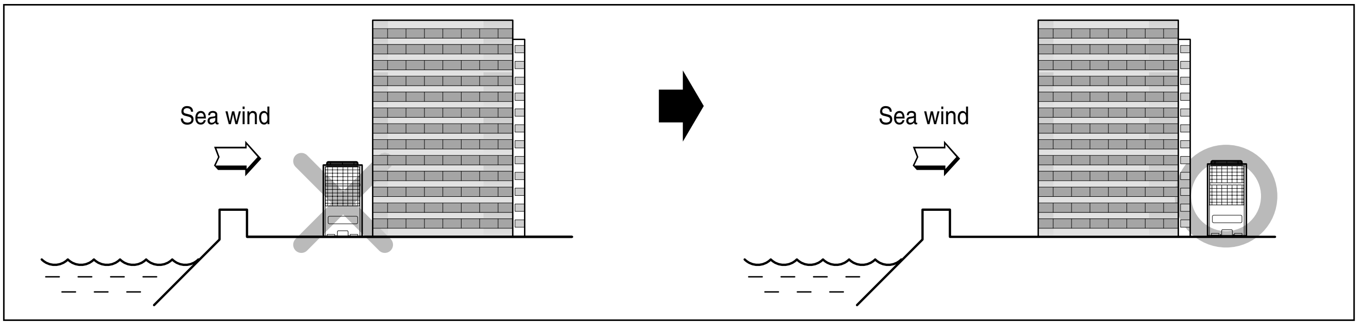
Seaside applications and installation

⚠ CAUTION

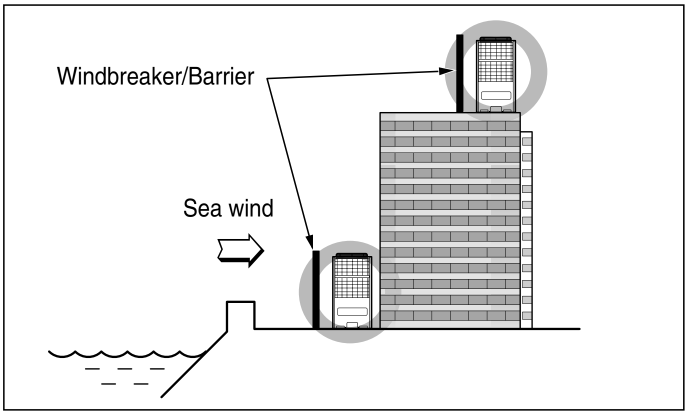
1. **Air conditioners should not be installed in areas where corrosive gases, such as acid or alkaline gas, are produced.**
2. **Do not install the product where it could be exposed to sea wind (salty wind) directly. It can result corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.**
3. **If outdoor unit is installed close to the seaside, it should avoid direct exposure to the sea wind.**

Selecting the location(Outdoor Unit)

1) If the outdoor unit is to be installed close to the seaside, direct exposure to the sea wind should be avoided. Install the outdoor unit on the opposite side of the sea wind direction.



2) To install the outdoor unit on the seaside, set up a windbreaker/barrier to keep the unit from being exposed to the sea wind.



- It should be strong enough (like concrete) to obstruct the wind from the sea.
- The height and width should be more than 150% of the outdoor unit.
- A minimum of 70cm (27.6inches) of space between outdoor unit and the windbreaker/barrier for easy air flow.

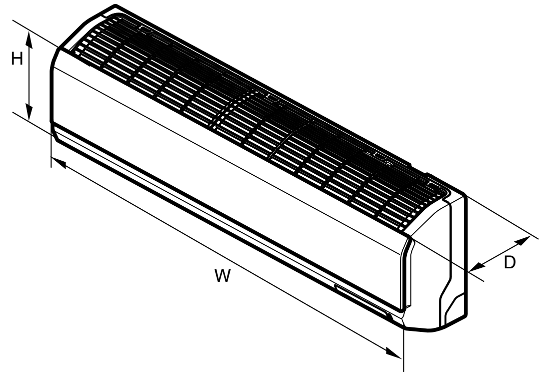
3) Select a well-drained place.

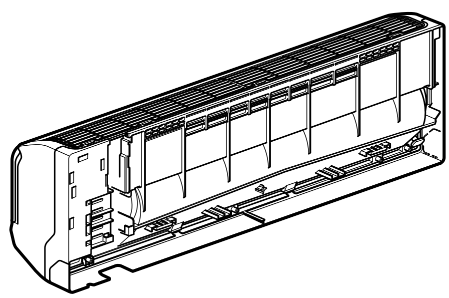
1. Periodic (more than once/year) cleaning of dust or salt particles stuck on the heat exchanger using water is recommended.

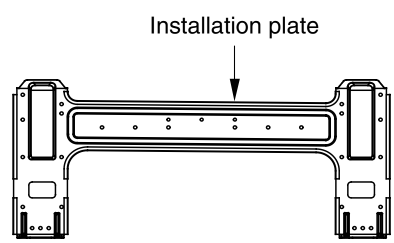
Dimensions

Indoor Unit

Split Type Indoor

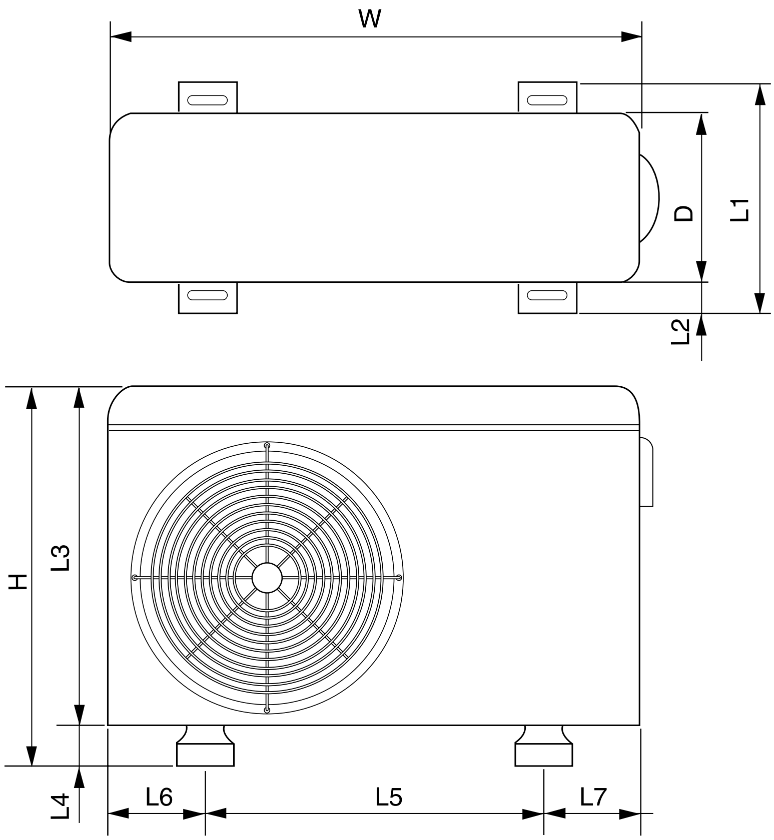


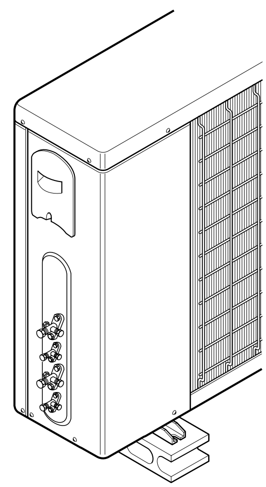




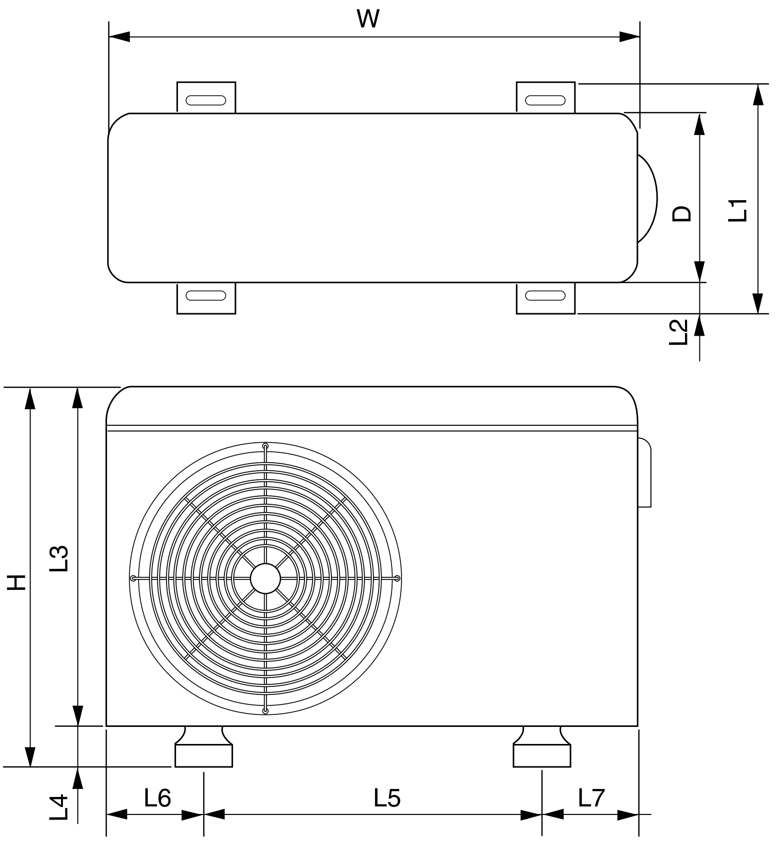
Dimension \ Model		Split Type	
		9 kBtu/h	12 kBtu/h
W	mm(in)	840(33)	895(35.2)
H	mm(in)	270(10.6)	282(11.1)
D	mm(in)	153(6)	165(6.5)

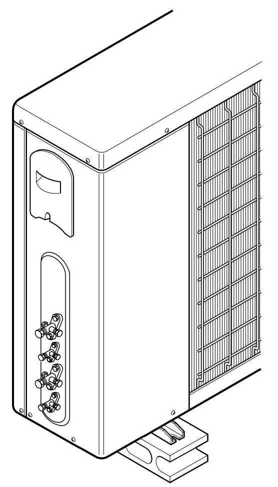
Outdoor Unit



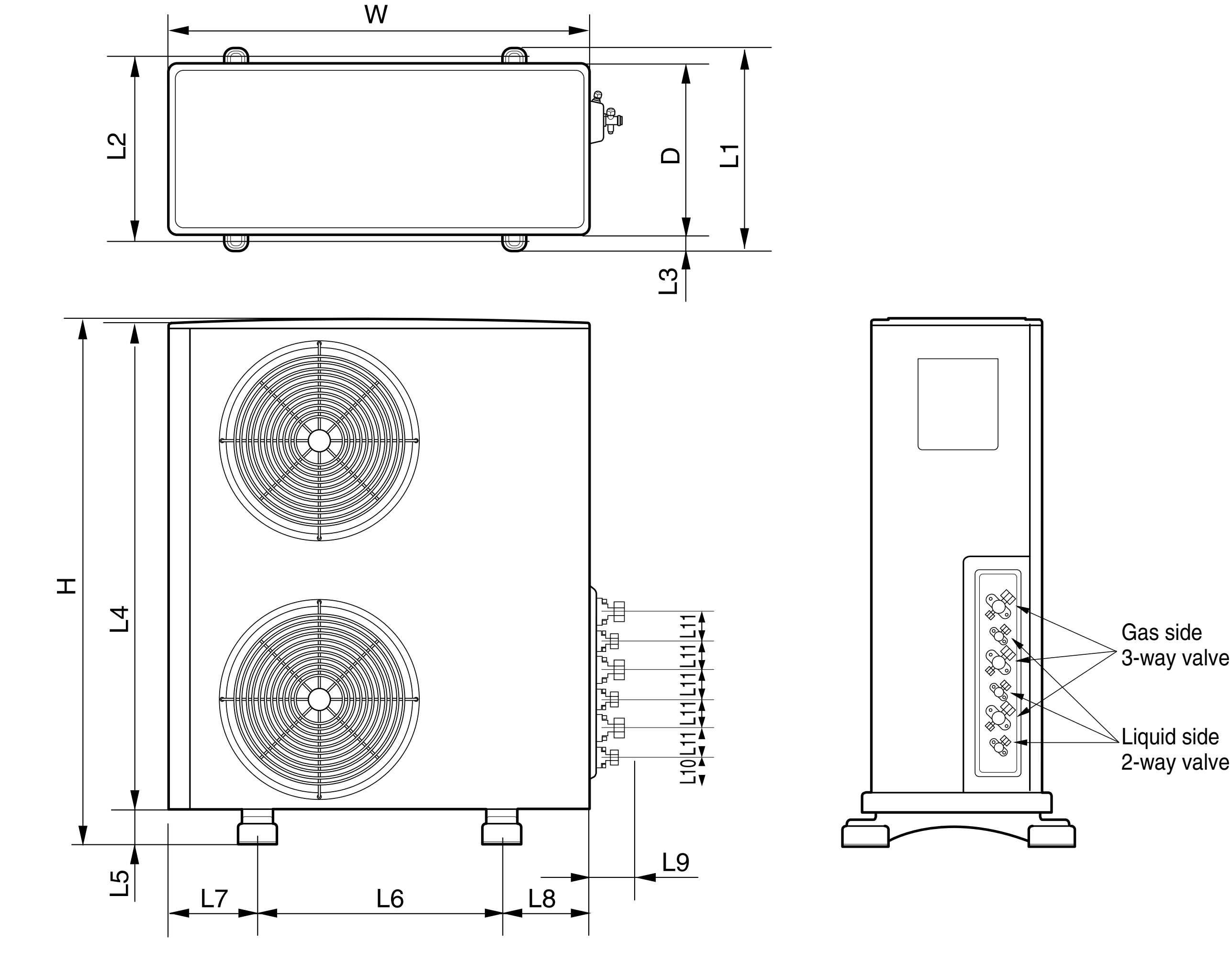


MODEL / DIM		UE 18kBtu/h
W	mm(in)	870(34.3)
H	mm(in)	655(25.8)
D	mm(in)	320(12.6)
L1	mm(in)	370(14.6)
L2	mm(in)	25(1.0)
L3	mm(in)	775(30.5)
L4	mm(in)	25(1.0)
L5	mm(in)	546(21.5)
L6	mm(in)	160(6.3)
L7	mm(in)	160(6.3)





DIM \ MODEL		UE 1 24kBtu/h
W	mm(in)	870(34.3)
H	mm(in)	808(31.8)
D	mm(in)	320(12.6)
L1	mm(in)	370(14.6)
L2	mm(in)	25(1.0)
L3	mm(in)	775(30.5)
L4	mm(in)	25(1.0)
L5	mm(in)	546(21.5)
L6	mm(in)	160(6.3)
L7	mm(in)	160(6.3)



DIM	MODEL	UE2 36kBtu/h
W	mm(in)	870(34.3)
H	mm(in)	1038(40.7)
D	mm(in)	320(12.6)
L1	mm(in)	360(14.2)
L2	mm(in)	340(13.4)
L3	mm(in)	25(1.0)
L4	mm(in)	1035(40.8)
L5	mm(in)	25(1.0)
L6	mm(in)	546(21.5)
L7	mm(in)	160(6.3)
L8	mm(in)	160(6.3)
L9	mm(in)	44(11.7)
L10	mm(in)	64.5(2.5)
L11	mm(in)	50(2.0)

Product Specifications

Indoor Unit

Indoor Unit Type			Wall Mounted			
Model			B-MMC09FA-1	B-MMH09FA-1	B-MMC12FA-1	B-MMH12FA-1
Nominal Cooling Capacity		kcal/h(W)	2,267(2,637)	2,267(2,637)	3,023(3,516)	3,023(3,516)
		Btu/h	9,000	9,000	12,000	12,000
Nominal Heating Capacity		kcal/h(W)	-	2,267(2,637)	-	3,023(3,516)
		Btu/h	-	9,000	-	12,000
Air Circulation		CFM(CMM)	289(8.2)	289(8.2)	332(9.4)	332(9.4)
Setting temperature range(cool/heat)		°C	18~30	18~30	18~30	18~30
Fan motor	Output	W	15	15	15	15
	Model		DL-88430LGIF	DL-88430LGIF	DL-88430LGIF	DL-88430LGIF
	Input	V	DC36	DC36	DC36	DC36
	Running Current	A	0.15	0.15	0.15	0.15
Fan	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	No. Used / Diameter	EA/inch(mm)	1/3.74(95)	1/3.74(95)	1/3.74(95)	1/3.74(95)
Noise Level (Sound Press,1m) H/M/L		dBA	31 / 29 / 22	31 / 29 / 22	36 / 32 / 29	36 / 32 / 29
Temperature controller			Thermistor	Thermistor	Thermistor	Thermistor
Coil	Tube Size (OD)	inch(mm)	0.197(5.0)	0.197(5.0)	0.197(5.0)	0.197(5.0)
	Fins per inch		20	20	18	18
	No. of Rows & Column		2R,15C	2R,15C	2R,15C	2R,15C
Dehumidification Rate		pints/day	-	12.4	-	13.5
Dimensions (W*H*D)		inch(mm)	33.0*10.6*6.0(840*270*153)	33.0*10.6*6.0(840*270*153)	35.2*11.1*6.5(895*282*165)	35.2*11.1*6.5(895*282*165)
Net Weight		lbs(kg)	15.4(7)	15.4(7)	20.9(9.5)	20.9(9.5)
Piping Connection	Liquid	inch(mm)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)	1/4 (6.35)
	Gas	inch(mm)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)
	Drain hose (ID Ø)	inch(mm)	0.79(20)	0.79(20)	0.79(20)	0.79(20)
Packing Dimension (W*H*D)		inch(mm)	35.7*13.1*8.8(906*332*223)	35.7*13.1*8.8(906*332*223)	38.3*9.1*14.6(973*231*372)	38.3*9.1*14.6(973*231*372)
Stuffing Quantity	With(Without) S/Parts	20/40ft(hi-c)	440/910 (1091)	440/910 (1091)	353/719 (792)	353/719 (792)

Note : 1. Due to our policy of innovation some specifications may be changed without notification.

Outdoor Unit - Multiple piping models

Model			A-MMC18FA-1	A-MMH18FA-1
Cooling Capacity		Btu/hr	18,000	18,000
		W	5,275	5,275
		kcal/hr	4,536	4,536
Heating Capacity		Btu/hr	-	18,000
		W	-	5,275
		kcal/hr	-	4,536
Input	Cooling	W	1,978	1,978
	Heating	W	-	1,960
Running Current(208/230V)	Cooling	A	8.8	8.8
	Heating	A	-	8.6
Power Supply		Ø,V,Hz	1,208/230,60	1,208/230,60
Max. Number of Connectable Indoor Units			2	2
Compressor (Constant)	Type		Rotary	Rotary
	Model		GK094K	GK094K
	Motor Type		Hermetic	Hermetic
	Quantity	Ea	1	1
	Motor Input	W	955	955
	Oil Charge	cc	330±10	330±10
	Oil Type		FVC68D	FVC68D
	Capacitor	μF/Vac	30 / 370	30 / 370
	O.L.P Type(model name)		External Type(MRA98996-12026)	External Type(MRA98996-12026)
Compressor (Constant)	Type		Rotary	Rotary
	Model		GK113K	GK113K
	Motor Type		Hermetic	Hermetic
	Quantity	Ea	1	1
	Motor Input	W	1,120	1,120
	Oil Charge	cc	330±10	330±10
	Oil Type		FVC68D	FVC68D
	Capacitor	μF/Vac	35 / 370	35 / 370
	O.L.P Type(model name)		External Type(MRA12124-12026)	External Type(MRA12124-12026)
Refrigerant charge	Charge	oz(g)	49.4(1400)	49.4(1400)
	Type		R410A	R410A
	Control		EEV	EEV
Coil	Tube Size (OD)	inch(mm)	0.276(7.0)	0.276(7.0)
	Fins per inch		18	18
	No. of Rows & Column/No.		2R,28C	2R,28C
Fan motor	Model		IC-1640LG GE	IC-1640LG GE
	Output	W	90	90
	Capacitor	μF/Vac	6/370	6/370
Fan	Type		Propeller	Propeller
	No. Used / Diameter	CFM(CMM)	1765.7(50)	1765.7(50)
	Discharge	Side / Top	Side	Side
Air Circulation	Outdoor	CMM(CFM)	50(1765.7)	50(1765.7)
Noise Level(H/L) at 230V	Sound Press,1m	dB(A) ± 1	51	51
Defrosting			-	Invertion Cycle
SVC Valve	Liquid	inch(mm)	1/4 (6.35) * 2EA	1/4 (6.35) * 2EA
	Gas		3/8 (9.52) * 2EA	3/8 (9.52) * 2EA
Dimensions	W*H*D	inch(mm)	34.3*25.8*12.6 (870*655*320)	34.3*25.8*12.6 (870*655*320)
Net Weight	Outdoor	lbs(kg)	125.7(57)	125.7(57)
Max. Interunit Piping Length	Total of Each Room	ft(m)	98.4(30)	98.4(30)
	For One Room	ft(m)	49.2(15)	49.2(15)
Max. Installation Height Difference	Indoor Unit~Outdoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
	Indoor Unit~Indoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
Packing Dimension	W*H*D	inch(mm)	40.2*28.2*17.2 (1020*716*437)	40.2*28.2*17.2 (1020*716*437)
Stuffing Quantity		20/40ft	81/171	81/171
SEER			13.0	13.0
HSPF			-	7.7

Note:

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 26.7˚C(80˚F) DB/19.4˚C(67˚F) WB
     - Outdoor Temperature 35˚C(95˚F) DB/23.9˚C(75˚F) WB
   - Heating: - Indoor Temperature 21.1˚C(70˚F) DB/15.6˚C(60˚F) WB
     - Outdoor Temperature 8.3˚C(47˚F) DB/6.1˚C(43˚F) WB
   - Piping Length - Interconnecting Piping Length 24.6 ft(7.5m)
     - Level Difference of Zero
2. Wiring cable size must comply with the applicable local and national code.
3. Capacities are Net Capacities.
4. The specification may be subject to change without prior notice for purpose of improvement.

Model			A-MMC24FA-1	A-MMH24FA-1
Cooling Capacity		Btu/hr	24,000	24,000
		W	7,033	7,033
		kcal/hr	6,037	6,037
Heating Capacity		Btu/hr	-	24,000
		W	-	7,033
		kcal/hr	-	6,037
Input	Cooling	W	2,526	2,526
	Heating	W	-	2440
Running Current(208/230V)	Cooling	A	11.4	11.4
	Heating	A	-	11.1
Power Supply		Ø,V,Hz	1,208/230,60	1,208/230,60
Max. Number of Connectable Indoor Units			2	2
Compressor (Constant)	Type		Rotary	Rotary
	Model		GK094K	GK094K
	Motor Type		Hermetic	Hermetic
	Quantity	Ea	1	1
	Motor Input	W	955	955
	Oil Charge	cc	330±10	330±10
	Oil Type		FVC68D	FVC68D
	Capacitor	μF/Vac	30 / 370	30 / 370
	O.L.P Type(model name)		External Type(MRA98996-12026)	External Type(MRA98996-12026)
Compressor (Constant)	Type		Rotary	Rotary
	Model		GK141K	GK141K
	Motor Type		Hermetic	Hermetic
	Quantity	Ea	1	1
	Motor Input	W	1430	1,430
	Oil Charge	cc	350±10	350±10
	Oil Type		FVE	FVE
	Capacitor	μF/Vac	35 / 370	35 / 370
	O.L.P Type(model name)		External Type(MRA12105-12026)	External Type(MRA12105-12026)
Refrigerant charge	Charge	oz(g)	56.4(1,600)	56.4(1,600)
	Type		R410A	R410A
	Control		EEV	EEV
Coil	Tube Size (OD)	inch(mm)	0.276(7.0)	0.276(7.0)
	Fins per inch		18	18
	No. of Rows & Column/No.		2R,36C	2R,36C
Fan motor	Model		IC-1640LG GE	IC-1640LG GE
	Output	W	90	90
	Capacitor	μF/Vac	6/370	6/370
Fan	Type		Propeller	Propeller
	No. Used / Diameter	CFM(CMM)	1 / 460	1 / 460
	Discharge	Side / Top	Side	Side
Air Circulation	Outdoor	CMM(CFM)	1872(53)	1872(53)
Noise Level(H/L) at 230V	Sound Press,1m	dB(A) ±1	54	54
Defrosting			-	Invertion Cycle
SVC Valve	Liquid	inch(mm)	1/4 (6.35) * 2EA	1/4 (6.35) * 2EA
	Gas		3/8 (9.52) * 2EA	3/8 (9.52) * 2EA
Dimensions	W*H*D	inch(mm)	34.3*31.8*12.6 (870*808*320)	34.3*31.8*12.6 (870*808*320)
Net Weight	Outdoor	lbs(kg)	141.1(64)	141.1(64)
Max. Interunit Piping Length	Total of Each Room	ft(m)	98.4(30)	98.4(30)
	For One Room	ft(m)	49.2(15)	49.2(15)
Max. Installation Height Difference	Indoor Unit~Outdoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
	Indoor Unit~Indoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
Packing Dimension	W*H*D	inch(mm)	40.2*34.3*17.2 (1022*870*437)	40.2*34.3*17.2 (1022*870*437)
Stuffing Quantity		20/40ft	54/114	54/114
SEER			13.0	13.0
HSPF			-	7.7

Note:

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 26.7˚C(80˚F) DB/19.4˚C(67˚F) WB
     - Outdoor Temperature 35˚C(95˚F) DB/23.9˚C(75˚F) WB
   - Heating: - Indoor Temperature 21.1˚C(70˚F) DB/15.6˚C(60˚F) WB
     - Outdoor Temperature 8.3˚C(47˚F) DB/6.1˚C(43˚F) WB
   - Piping Length - Interconnecting Piping Length 24.6 ft(7.5m)
     - Level Difference of Zero
2. Wiring cable size must comply with the applicable local and national code.
3. Capacities are Net Capacities.
4. The specification may be subject to change without prior notice for purpose of improvement.

Model			A-MMC36FA-1	A-MMH36FA-1
Cooling Capacity		Btu/hr	36,000	36,000
		W	10,550	10,500
		kcal/hr	9,071	9,071
Heating Capacity		Btu/hr	-	36,000
		W	-	10,500
		kcal/hr	-	9,071
Input	Cooling	W	4,045	4,045
	Heating	W	-	3340
Running Current(208/230V)	Cooling	A	18.2	18.2
	Heating	A	-	17.9
Power Supply		Ø,V,Hz	1,208/230,60	1,208/230,60
Max. Number of Connectable Indoor Units			3	3
Compressor (Constant)	Type		Rotary	Rotary
	Model		GK141K	GK141K
	Motor Type		2 Pole Induction(PSC)	2 Pole Induction(PSC)
	Quantity	Ea	1	1
	Motor Input	W	1430	1430
	Oil Charge	cc	350Å}10	350Å}10
	Oil Type		FVC68D	FVC68D
	Capacitor	μF/Vac	35 / 370	35 / 370
	O.L.P Type(model name)		External Type	External Type
Compressor (Constant)	Type		Rotary	Rotary
	Model		GJ230K	GJ230K
	Motor Type		2 Pole Induction(PSC)	2 Pole Induction(PSC)
	Quantity	Ea	1	1
	Motor Input	W	2370	2370
	Oil Charge	cc	700±10	7000±10
	Oil Type		FVC68D	FVC68D
	Capacitor	μF/Vac	50 / 400	50 / 400
	O.L.P Type(model name)		Internal Type	Internal Type
Refrigerant charge	Charge	oz(g)	84.7(2400)	84.7(2400)
	Type		R410A	R410A
	Control		EEV	EEV
Coil	Tube Size (OD)	inch(mm)	0.276(7.0)	0.276(7.0)
	Fins per inch		18	18
	No. of Rows & Column/No.		2R,48C	2R,48C
Fan motor	Model		ARC286B01 * 2	ARC286B01 * 2
	Output	W	102	102
	Capacitor	μF/Vac	2/370	2/370
Fan	Type		Propeller	Propeller
	No. Used / Diameter	EA/inch(mm)	2 / 15.7(400)	2 / 15.7(400)
	Discharge	Side / Top	Side	Side
Air Circulation	Outdoor	CFM(CMM)	2225(63)	2225(63)
Noise Level(H/L) at 230V	Sound Press,1m	dB(A) ±1	51	51
SVC Valve	Liquid	inch(mm)	1/4 (6..35) * 3EA	1/4 (6..35) * 3EA
	Gas		3/8 (9.52) * 3EA	3/8 (9.52) * 3EA
Dimensions	W*H*D	inch(mm)	34.3*40.7*12.6 (870*1038*320)	34.3*40.7*12.6 (870*1038*320)
Net Weight	Outdoor	lbs(kg)	185.2(84)	185.2(84)
Max. Interunit Piping Length	Total of Each Room	ft(m)	147.6(45)	147.6(45)
	For One Room	ft(m)	49.2(15)	49.2(15)
Max. Installation Height Difference	Indoor Unit~Outdoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
	Indoor Unit~Indoor Unit	ft(m)	24.6(7.5)	24.6(7.5)
Packing Dimension	W*H*D	inch(mm)	41.3*44.9*17.3 (1048*1140*439)	41.3*44.9*17.3 (1048*1140*439)
Stuffing Quantity		20/40ft	53/111	53/111
SEER			13.0	13.0
HSPF			-	7.7

Note:

1. Capacities are based on the following conditions:
   - Cooling: - Indoor Temperature 26.7˚C(80˚F) DB/19.4˚C(67˚F) WB
     - Outdoor Temperature 35˚C(95˚F) DB/23.9˚C(75˚F) WB
   - Heating: - Indoor Temperature 21.1˚C(70˚F) DB/15.6˚C(60˚F) WB
     - Outdoor Temperature 8.3˚C(47˚F) DB/6.1˚C(43˚F) WB
   - Piping Length - Interconnecting Piping Length 24.6 ft(7.5m)
     - Level Difference of Zero
2. Wiring cable size must comply with the applicable local and national code.
3. Capacities are Net Capacities.
4. The specification may be subject to change without prior notice for purpose of improvement.

Installation

Read carefully and then follow step-by-step.

Installation Parts

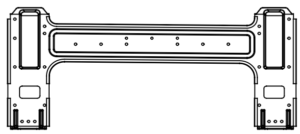
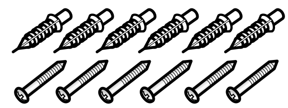
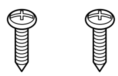
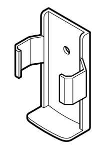
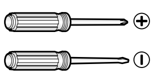
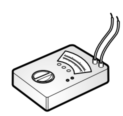
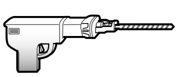
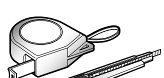
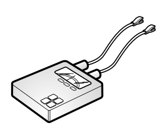
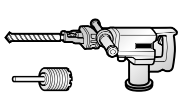
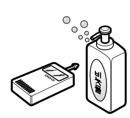
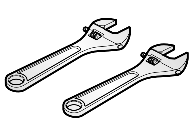
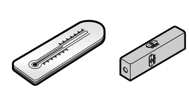
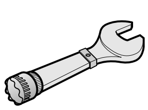
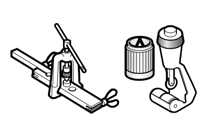
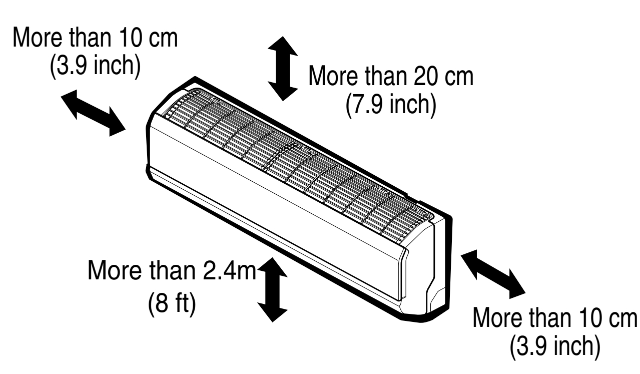
Installation plate	Type "A" screw and plastic anchor
	
Type "B" screw	Remote Control Holder
	

Figure	Name	Figure	Name
	Screw driver		Ohmmeter
	Electric Drill		Hexagonal wrench
	Measuring Tape, Knife		Ammeter
	Hole Core Drill		Gas Leak Detector
	Adjustable Wrench		Thermometer, Level
	Torque wrench		Flaring Tool Set

Selecting the best location

Indoor unit

1. Do not have any heat or steam near the unit.
2. Select a place where there are no obstacles in front of the unit.
3. Make sure that condensation drainage can be conveniently routed away.
4. Do not install near a doorway.
5. Ensure the unit is unobstructed, allow proper space on all sides according to the arrows and distance measurements in the figures.
6. Use a metal detector or stud finder to locate studs to prevent unnecessary damage to the wall.

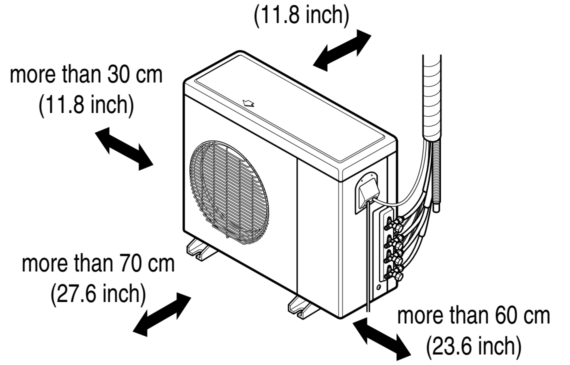


CAUTION: Install the indoor unit on the wall where the height from the floors more than 2.4 m (8 ft).

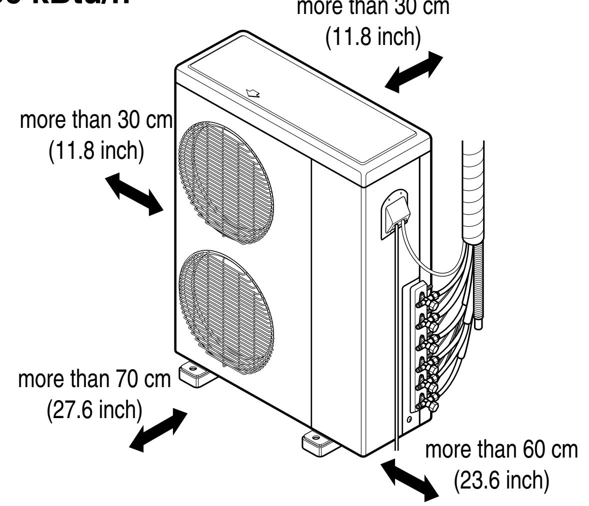
Outdoor unit

1. If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
2. Ensure the unit is unobstructed, allow proper space on all sides according to the arrows and distance measurements in the figures.
3. Do not place animals and plants in the path of the warm air.
4. Take the air conditioner weight into account and select a place where noise and vibration are minimum.
5. Select a place so that the warm air and sound from the air conditioner does not disturb neighbors.

18 / 24 kBtu/h



36 kBtu/h



Rooftop Installations:

If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.

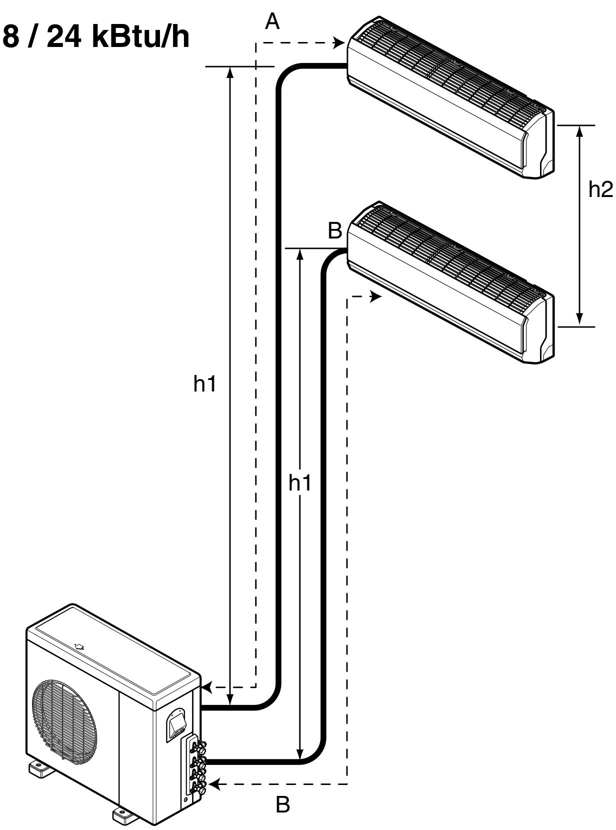
Piping length and elevation

Multi Piping Type

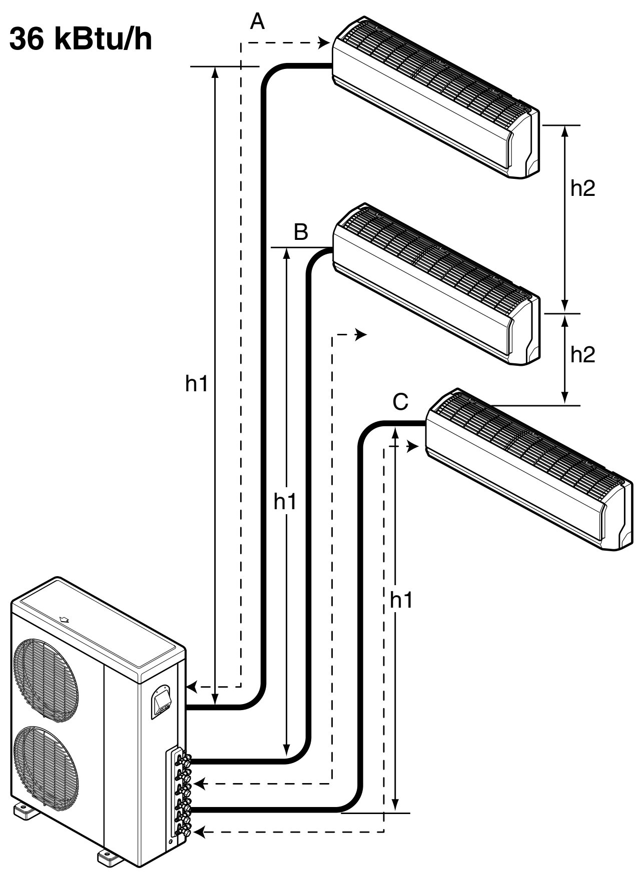
Capacity	Max total length of all pipes (A+B/A+B+C)	Max length of each pipe (A/B/C)	Min length of each pipe (A/B/C)	Max Elevation between each indoor unit and outdoor unit (h1)	Max elevation between indoor units (h2)
18 kBtu	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)
24 kBtu	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)
36 kBtu	45 m (150 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)

Indoor Capacity	Pipe Size			
	Gas	Liquid	Standard Length	Additional Refrigerant
9 kBtu	9.52 mm (3/8")	6.35 mm (1/4")	7.5 m (25 ft)	20 g/m (0.22 oz/ft)
12 kBtu	9.52 mm (3/8")	6.35 mm (1/4")	7.5 m (25 ft)	20 g/m (0.22 oz/ft)

18 / 24 kBtu/h



36 kBtu/h



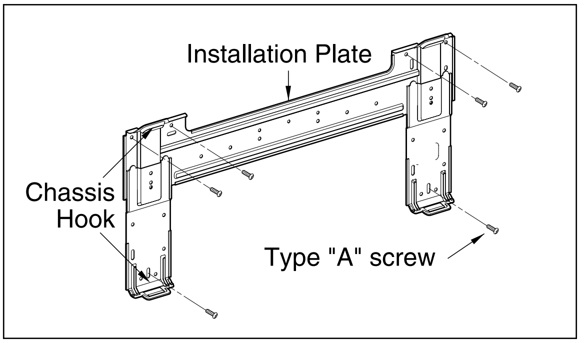
CAUTION: Capacity is based on standard length and maximum allowance length is on the basis of reliability.

Installing Installation Plate(Standard Type)

The wall you select should be strong and solid enough to prevent vibration

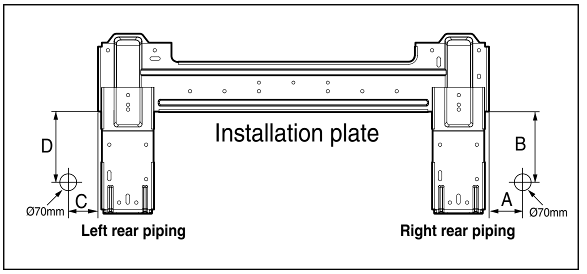
1. Mount the installation plate on the wall with type "A" screws. If mounting the unit on a concrete wall, use anchor bolts.

• Mount the installation plate horizontally by aligning the centerline using a level.

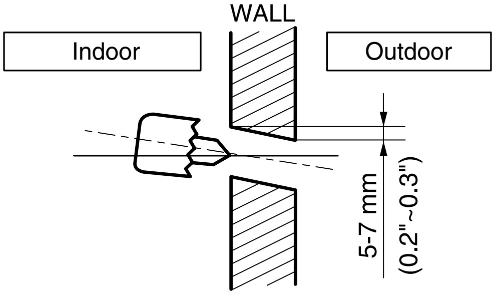


2. Measure the wall and mark the centerline. It is also important to use caution regarding the location of the installation plate, as routing the wiring through the wall is typically done in this application. Drilling the hole through the wall for piping connections must be done safely.

CHASSIS	Distance (mm)			
	A	B	C	D
9 kBtu/h	50(1.97)	105(4.13)	59(2.32)	105(4.13)
12 kBtu/h	65(2.56)	110(4.33)	85(3.35)	110(4.33)



• Drill the piping hole with a Ø 70 mm (Ø 2.75 inch) hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.



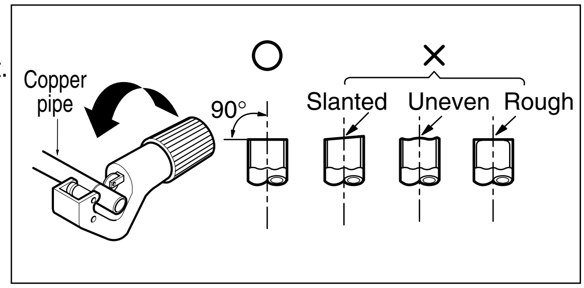
Flaring Work and Connection of Piping

Flaring work

The main cause for gas leakage is due to defects in flaring work. Carry out correct flaring work using the following procedures.

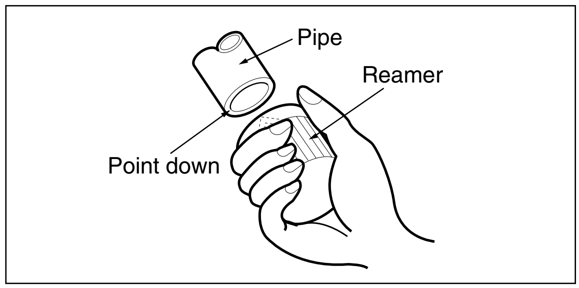
Cut the pipes

1. Use the copper pipe purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than measured distance.
4. Cut the cable 1.5m (5.0ft) longer than the pipe length.



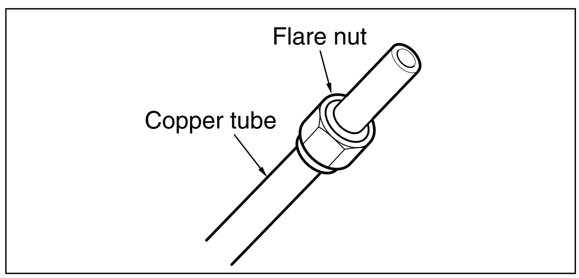
Burrs removal

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.



Adding the Flare Nut

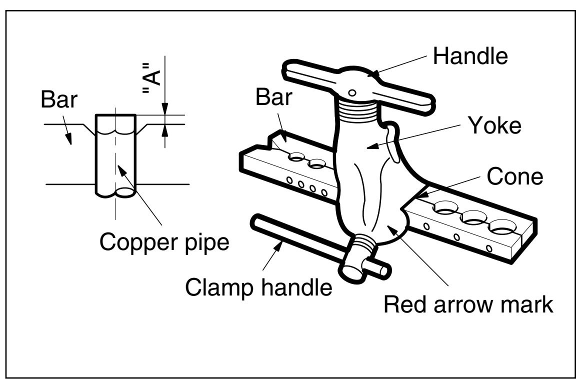
- Remove flare nuts attached to the indoor and outdoor unit, then put them on the end of the copper pipe once you hav completed burr removal (it is not possible to put them on after the flaring work)



Flaring work

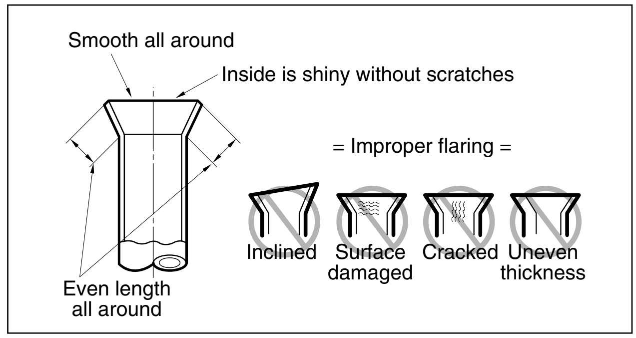
- Carry out flaring work using flaring tool as shown below.
- Firmly hold copper pipe in the proper size hole dimension of the bar as shown in the table below.

Outside diameter		A
mm	inch	mm
Ø6.35	1/4	0~0.5
Ø9.52	3/8	0~0.5



Check

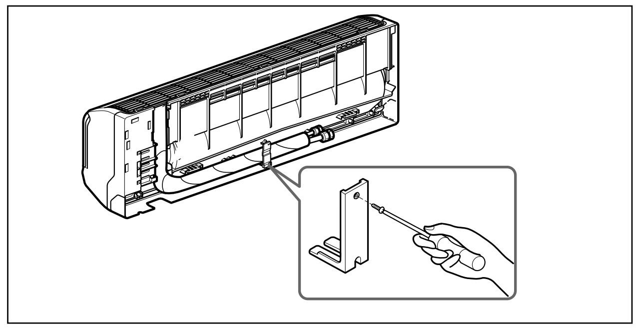
1. Compare the flare work like the figure on the right.
2. If a flared section is defective, cut it off and repeat the flaring process again.



Connecting the Piping

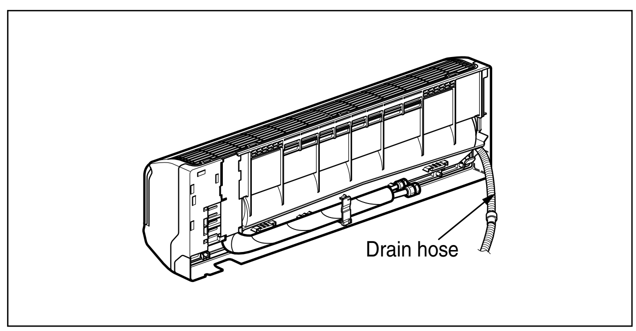
Indoor

1. Prepare the indoor unit's piping and drain hose for installation through the wall.
2. Remove the plastic tubing retainer(see illustration on the right) and pull the tubing and drain hose away from chassis.



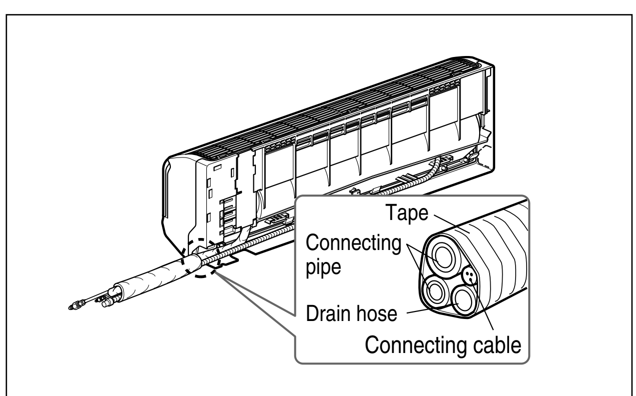
For right rear piping

1. Route the indoor tubing and the drain hose in the direction of rear right.
2. Insert the connecting cable into the indoor unit from the outdoor unit through the piping hole.
   • Do not connect the cable to the indoor unit.
   • Make a small loop with the cable for easy connection later.
3. Tape the tubing, drain hose, and the connecting cable. Be sure that the drain hose is located on the lowest side of the bundle. Locating on the Upper side can cause the condensation to overflow in the drain pan inside the indoor unit.



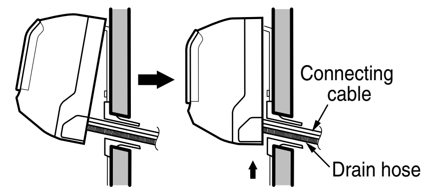
⚠ CAUTION

If the drain hose is routed inside the room, insulate the hose with an insulation material* so that dripping from "sweating"(condensation) will not damage furniture or floors.
*Foamed polyethylene or equivalent is recommended.



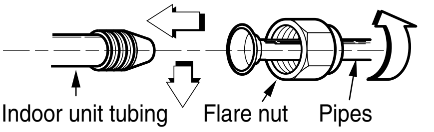
4. Indoor unit installation
   Hook the indoor unit onto the upper portion of the installation plate.(Engage the two hooks of the rear top of the indoor unit with the upper edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving the indoor unit left and right.

   Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

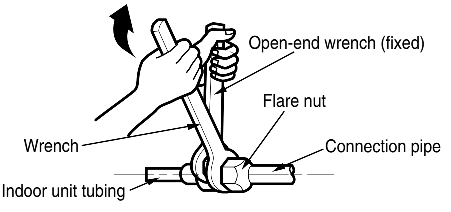


Connecting the piping to the indoor unit and drain hose to drain pipe.

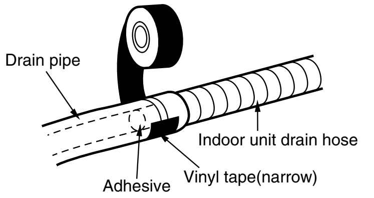
1. Align the center of the pipes and sufficiently tighten the flare nut by hand.
2. Tighten the flare nut with a torque.



Outside diameter		Torque	
mm	inch	kg·m	lbf.in
Ø6.35	1/4	1.8	156.2
Ø9.52	3/8	4.2	364.5

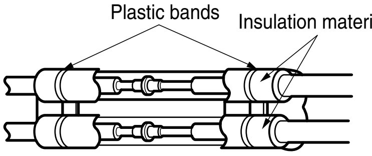


3. Next, extend the indoor unit's drain hose.
   Then attach the drain pipe.

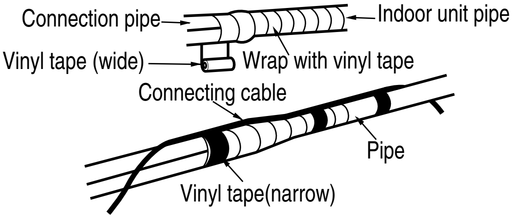


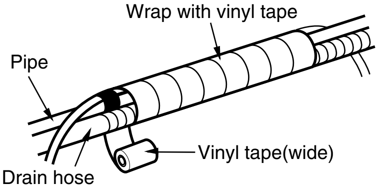
Wrap the insulation material around the all connections.

1. Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.
2. Wrap the area which accommodates the rear piping housing section with vinyl tape.



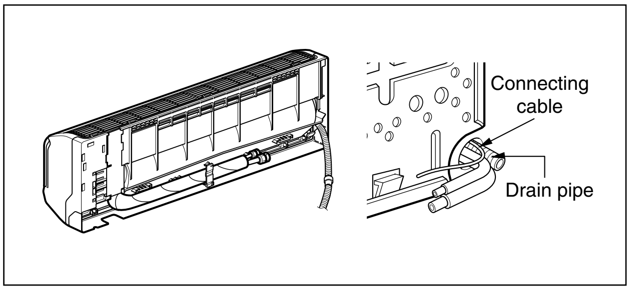
3. Bundle the piping and drain hose together by wrapping them with vinyl tape, enough to cover where they fit into the rear piping housing section.

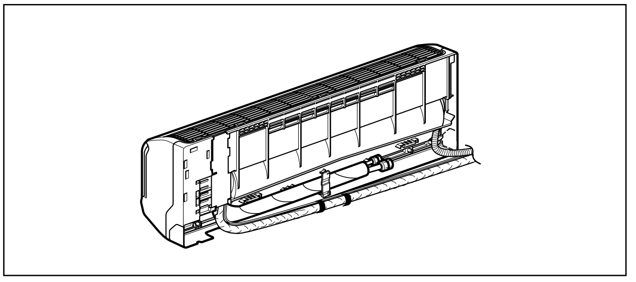




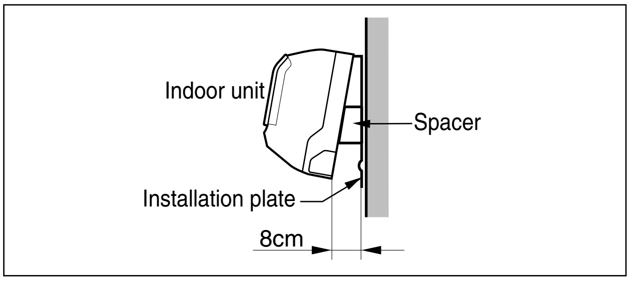
For left rear piping

1. Route the indoor tubing and the drain hose to the required piping hole position.
2. Insert the piping, drain hose, and the connecting cable into the piping hole.
3. Insert the connecting cable into the indoor unit.
   • Don't connect the cable to the indoor unit.
   • Make a small loop with the cable for easy connection later.
4. Tape the drain hose and the connecting cables.



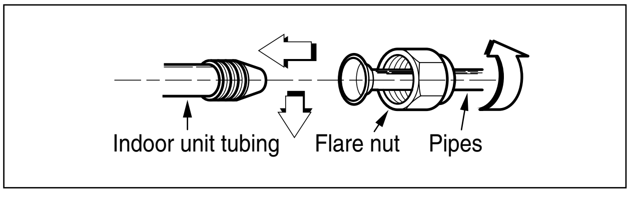


5. Indoor unit installation
   • Hang the indoor unit from the hooks at the top of the installation plate.
   • Insert the spacer. between the indoor unit and the installation plate to separate the bottom of the indoor unit from the wall. (The spacer is used to ease installation and will be removed later on per the installation instructions.)



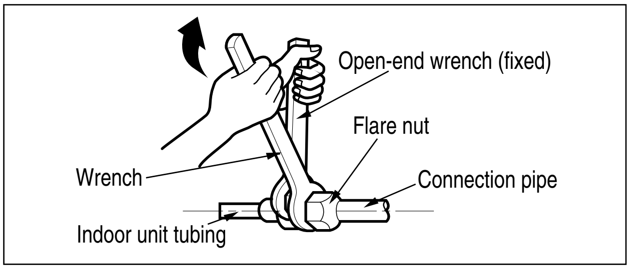
Connecting the piping to the indoor unit and the drain hose to drain pipe.

1. Align the center of the pipes and sufficiently tighten the flare nut by hand.

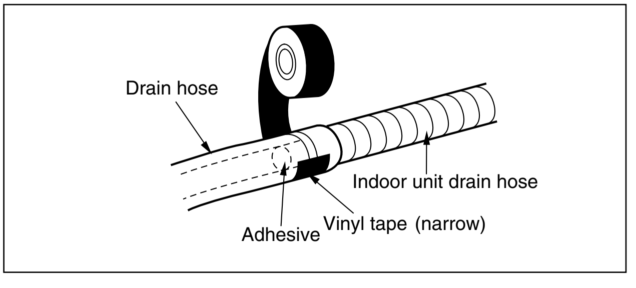


2. Tighten the flare nut with a wrench.

Outside diameter		Torque	
mm	inch	kg·m	lbf.in
Ø6.35	1/4	1.8	156.2
Ø9.52	3/8	4.2	364.5

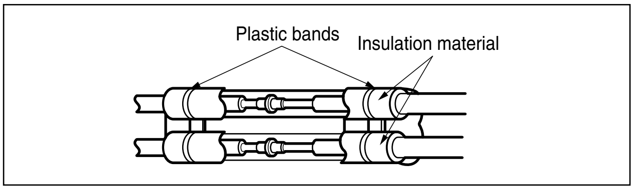


3. Next, extend the indoor unit's drain hose. Then attach the drain pipe.

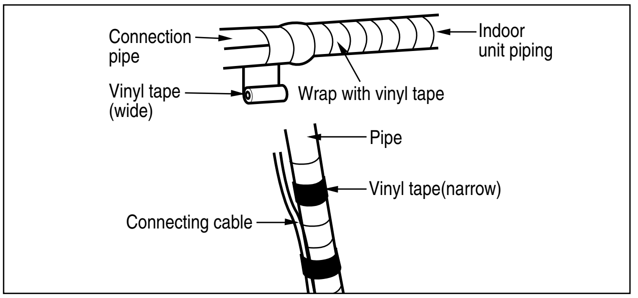


Wrap the insulation material around the connecting portion.

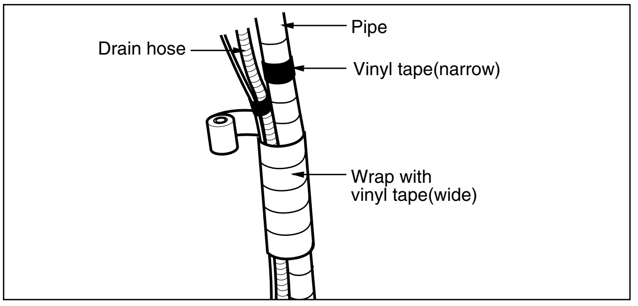
1. Overlap the connection pipe insulation and the indoor unit pipe heat insulation material. Bind them together with vinyl tape so that there is no gap.



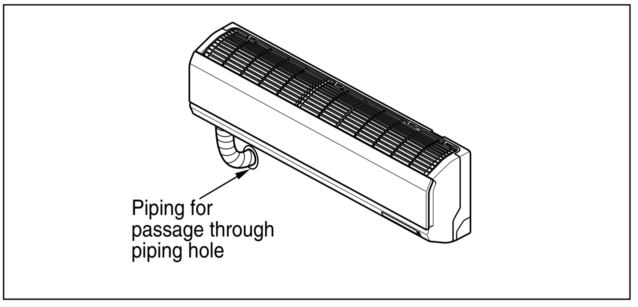
2. Wrap the area which accommodates the rear piping housing section with vinyl tape.



3. Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.

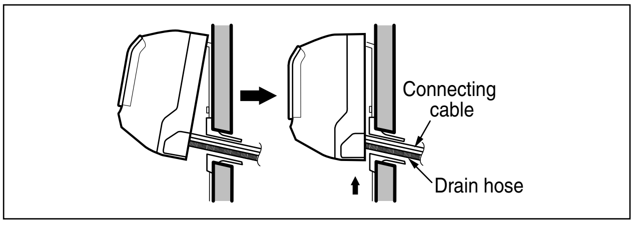


Reroute the pipings and the drain hose across the back of the chassis.



Indoor unit installation

1. Remove the spacer.
2. Ensure that the hooks are properly seated on the installation plate by moving it left and right.
3. Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

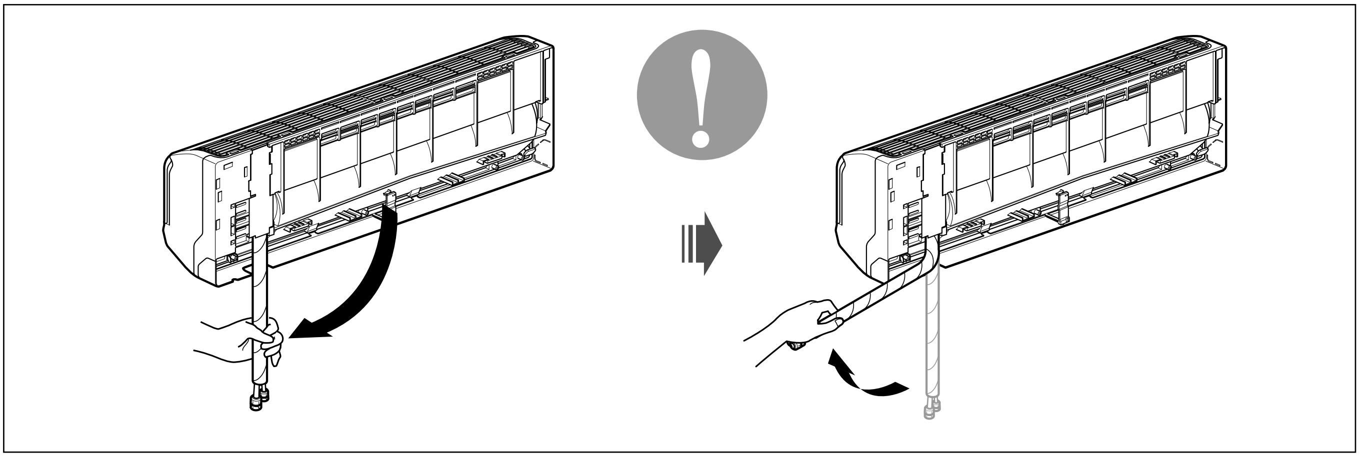


⚠ CAUTION

Installation Information. For left piping. Follow the instruction below.

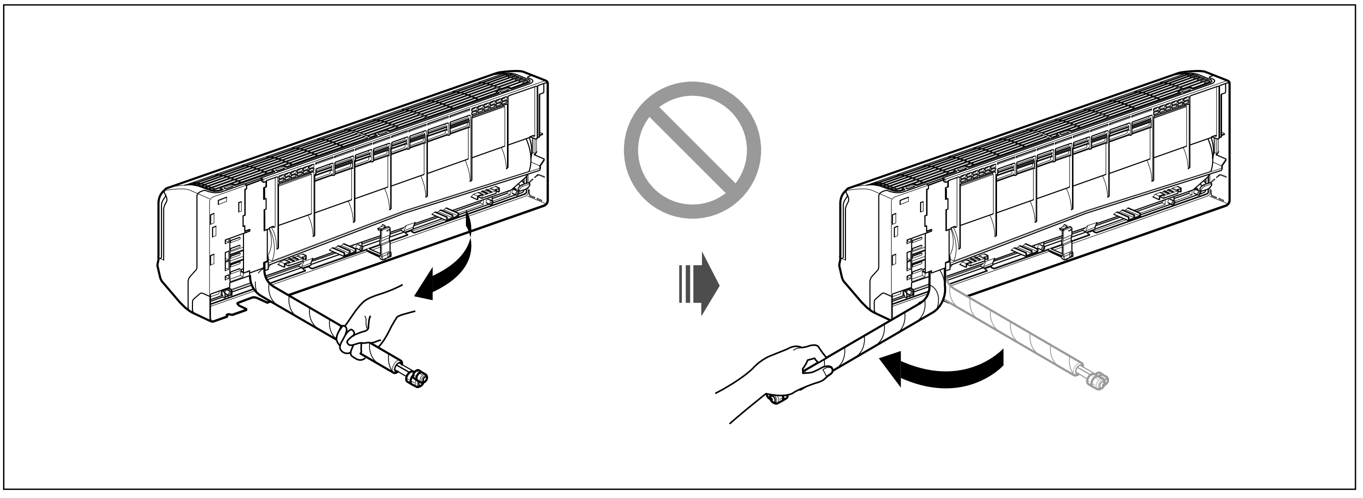
Good case

• Press on the upper side of clamp and unfold the tubing to slowly downward.



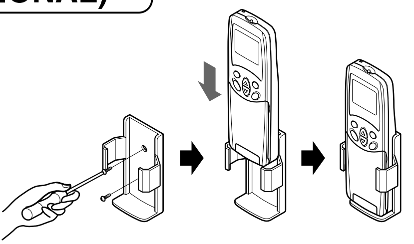
Bad case

• Bending the pipe from right to left may cause damage to the tubing.



REMOTE CONTROL PREPARATION(OPTIONAL)

HOW TO MOUNT ONTO A WALL

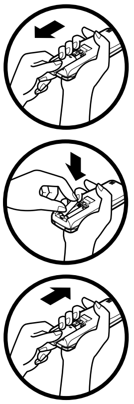


HOW TO INSERT BATTERIES

1 Remove the battery cover from the remote controller.
- Slide the cover according to the arrow direction.

2 Insert the two batteries.(AAA, 1.5V)
- Be sure that the (+) and (-) directions are correct.
- Be sure that both batteries are new.

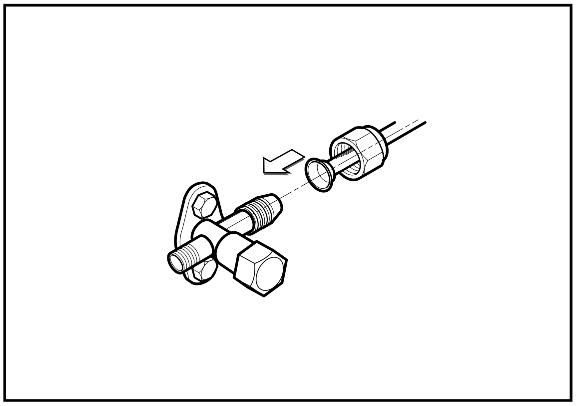
3 Re-attach the cover.
- Slide it back into position.



- Do not use rechargeable batteries, such batteries differ from standard dry cells in shape, dimensions, and performance.
- Romove the batteries from the remote controller if the air conditioner is not going to be used for a long length of time.

Outdoor

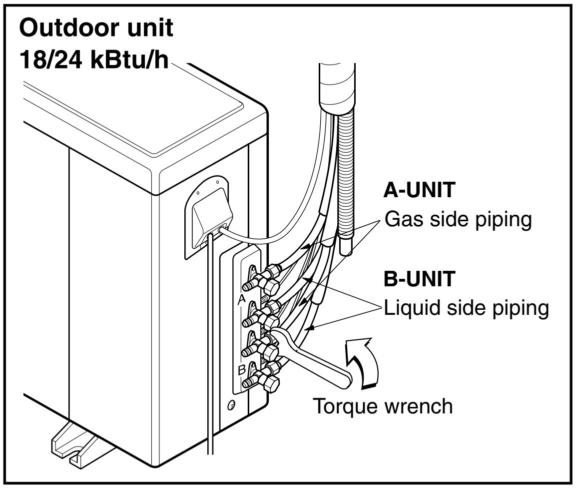
Align the center of the piping and sufficiently tighten the flare nut by hand.

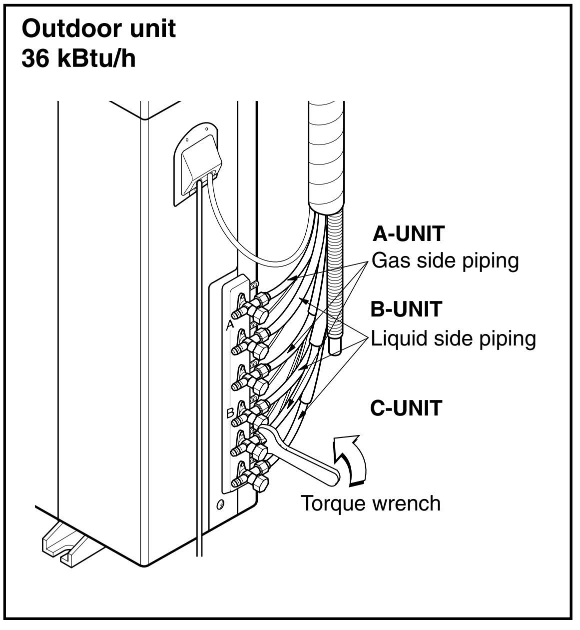


Finally, tighten the flare nut with torque wrench until the wrench clicks.

• When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

Outside diameter		Torque	
mm	inch	kg·m	lbf.in
Ø6.35	1/4	1.8	156.2
Ø9.52	3/8	4.2	364.5





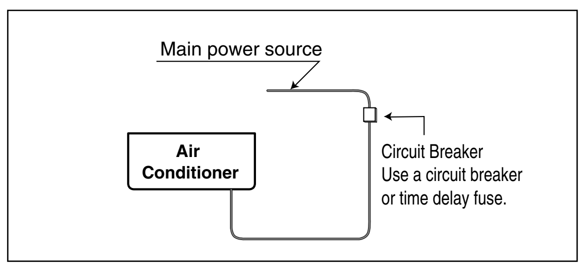
Connecting the Cable between Indoor Unit and Outdoor Unit

Connect the cable to the Indoor unit.

Connect the cable to the indoor unit by connecting the wires to the terminals on the control board individually according to the outdoor unit connection. (Ensure that the color of the wires of the outdoor unit and the terminal No. are the same as those of the indoor unit.)
The ground wire should be longer than the common wires.
The circuit diagram is subject to change without notice.
When installing, refer to the electrical diagram behind the front panel of Indoor Unit.
The wiring for the outdoor unit can be found on the inside of the Outdoor Unit control cover.

WARNING:
- **The circuit diagram is subject to change without notice.**
- **Be sure to connect wires according to the wiring diagram.**
- **Connect the wires firmly, so that they can not be pulled out easily.**
- **Connect the wires according to color codes by referring to the wiring diagram.**

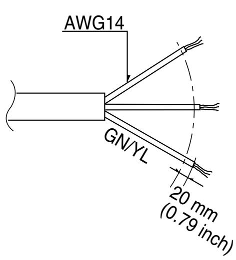
WARNING: Provide a circuit breaker between power source and the outdoor unit as shown below.



WARNING: The power cord connected to the outdoor unit should comply with the following specifications: ETL recognized and CSA certified.

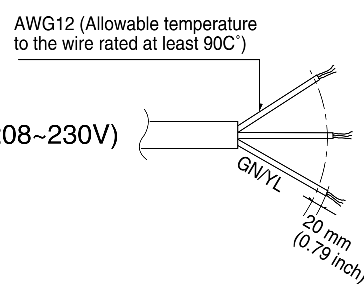
18 / 24 kBtu/h

Line voltage (208~230V)



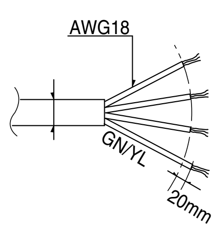
36 kBtu/h

Line voltage (208~230V)



The power connecting cable connected to the indoor and outdoor unit should comply with the following specifications: ETL recognized and CSA certified.

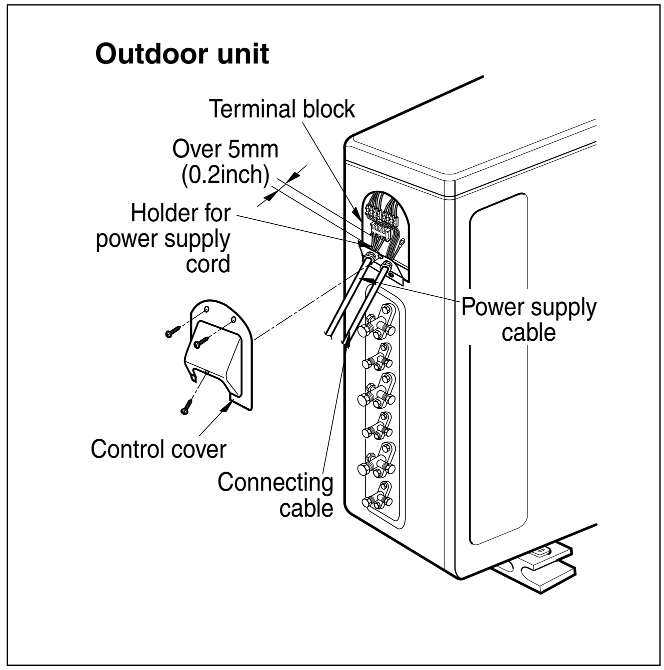
Low voltage (below 40V)



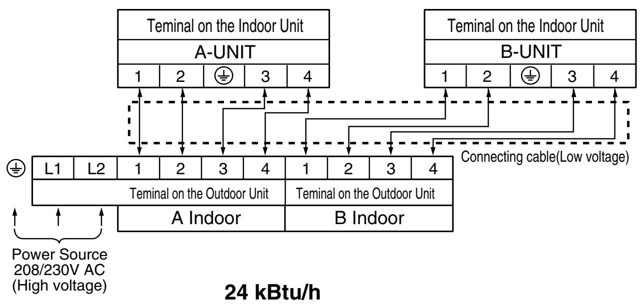
WARNING: When using the separate wires as the power cord, please secure the separate wires into the control box panel using tie wraps to hold all wires together in place.

Connect the cable to the Outdoor unit.

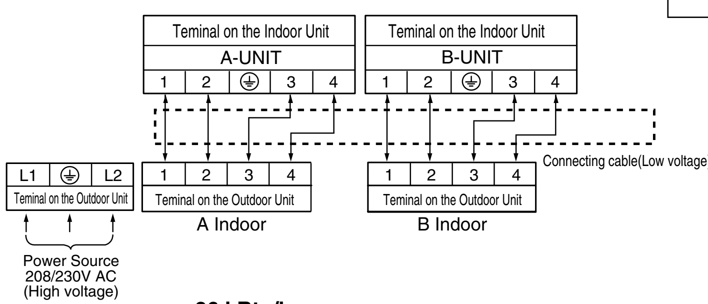
1. Remove the control cover from the unit by loosening the screw.
   Connect the wires to the terminals on the control board individually as the following.
2. Secure the cable onto the control board with the holder (clamper).
3. Re-attach the control cover to the original position using the screws.



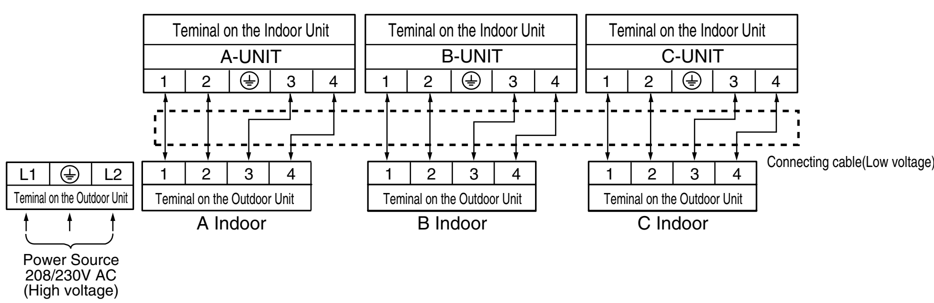
18 kBtu/h



24 kBtu/h



36 kBtu/h



NOTICE :

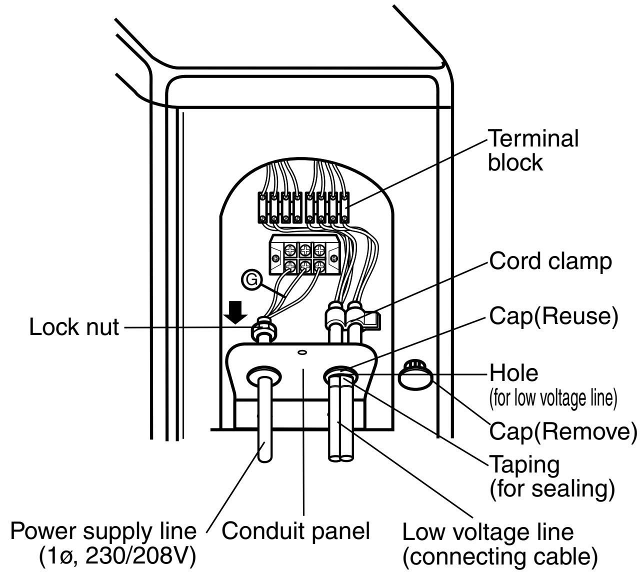
1. Separately wire the high and low voltage lines.
2. Use heat resistant electrical wiring capable of withstanding temperatures up to 75°C(167°F).
3. Use outdoor waterproof connection cable rated for at least 300V for the connection between indoor and outdoor unit.
   (For example, Type SJO-WA)

WARNING:

- **Be sure to comply with local codes while running the wire from the indoor unit to the outdoor unit(size of wire and wiring method, etc).**
- **Every wire must be connected firmly.**
- **No wire should be allowed to touch refrigerant tubing, the compressor or any moving parts.**

Methods of connecting the cable

(1) Remove two-caps on the conduit panel. (for low voltage line)
(2) Pull out connection cable through conduit.
(3) After conduit to the panel, fix nut to the opposite side of panel.
(4) Pass the connection cable through the hole.
(5) Properly connect the cable on the terminal block.
(6) Fix the connection cable with cord clamp provided on the unit to reduce strain at the terminal when the connection cable is pulled outside up to a 35 pound weight



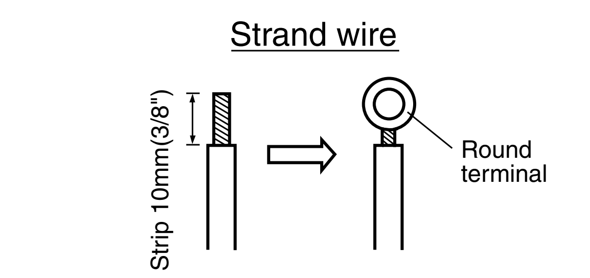
WARNING: Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.

When connecting each power wire to the corresponding terminal, follow instructions "How to connect wiring to the terminals" and fasten the wire tightly using the screw on the terminal plate.

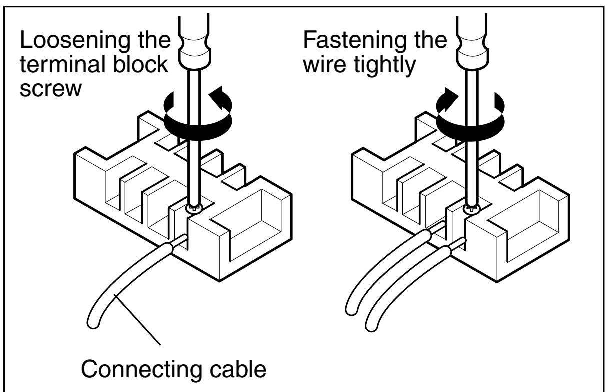
How to connect wiring to the terminals

■ For strand wiring
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to expose the strand wiring about 10mm(3/8").
(2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.
(3) Using a round terminal fastener or pliers, securely clamp each stripped wire end with a round terminal.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

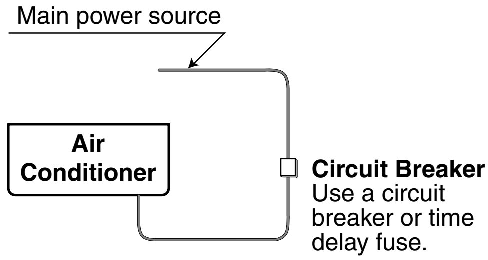
High voltage



Low voltage



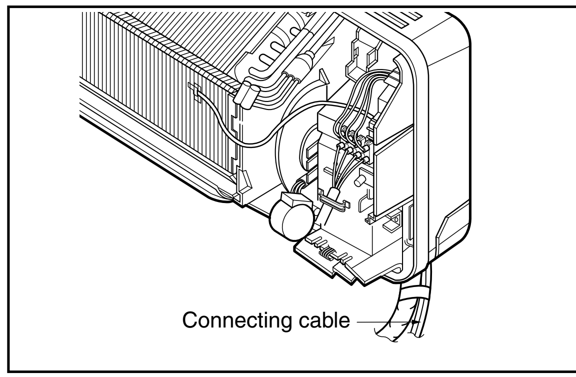
CAUTION: Provide a circuit breaker between power source and the unit as shown below.



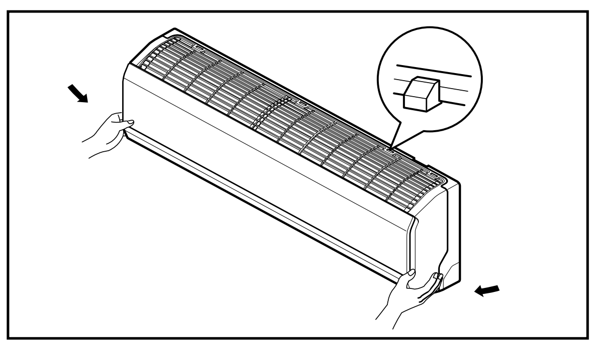
Model	Power source	Fuse or breaker Capacity
18 kBtu/h	1Ø, 230 / 208V	20 A
24 kBtu/h	1Ø, 230 / 208V	25 A
36 kBtu/h	1Ø, 230 / 208V	40 A

Connect the cable to the indoor unit

1. Connect the wires to the terminals on the control board individually according to the outdoor unit connection.
   - Ensure that the color of the wires of outdoor unit and the terminal No. are the same as those of indoor unit respectively.



2. Attach the Grille onto the cabinet.
   - Grasp the lower left and right side of the Grille and engage four tabs on the top inside edge of the chassis.
   - Press the Grille toward the chassis until it goes back into place.

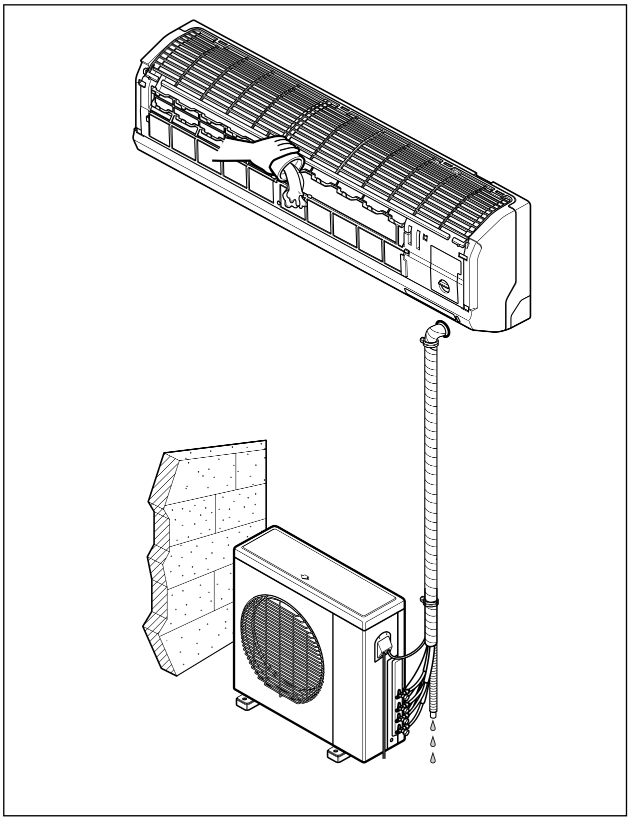


Checking the Drainage, Insulating the Pipe and Special Piping Applications

Checking the drainage

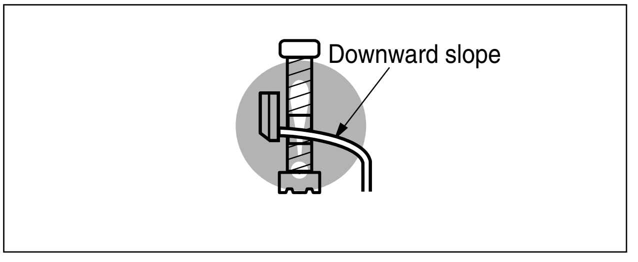
To check the drainage.

1. Pour a glass of water on the evaporator.
2. Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out the drain exit.

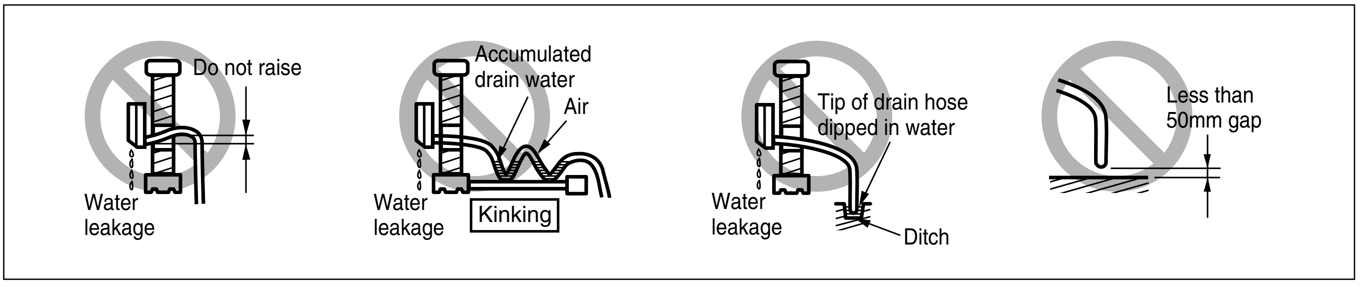


Drain piping

1. The drain hose should point downward for easy drain flow.



2. See below for examples of incorrect drain pipe applications, which will cause poor condensate flow.



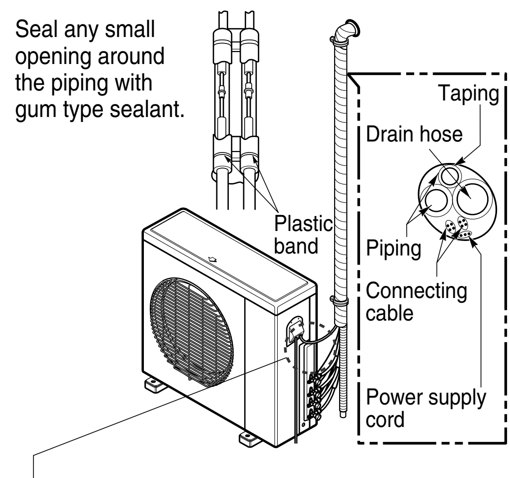
Insulating the Pipe and Special Piping Applications

Insulate the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two layers of vinyl tape.

- If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

In cases where the outdoor unit is installed below the indoor unit, perform the following:

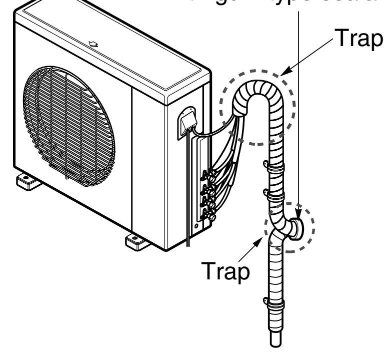
1. Tape the piping, drain hose and connecting cable from downward to upward.
2. Secure the taped piping along the exterior wall using saddle or equivalent.



- Trap is required to prevent water from entering into electrical parts.

In cases where the Outdoor unit is installed above the Indoor unit, perform the following.

1. Tape the piping and connecting cable from down to up.
2. Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.
3. Secure the piping onto the wall using a saddle or equivalent.



Air Purging and Evacuation

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.
1. Pressure in the system rises.
2. Operating current rises.
3. Cooling(or heating) efficiency drops.
4. Moisture in the refrigerant circuit may freeze and block capillary tubing.
5. Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor/outdoor unit and connecting tube must be checked for leaks, and vacuumed to remove incondensible gas and moisture in the system.

Leak checking

Preparation

• Check that each copper pipe(both liquid and gas side) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Check that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

Leakage test

• Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

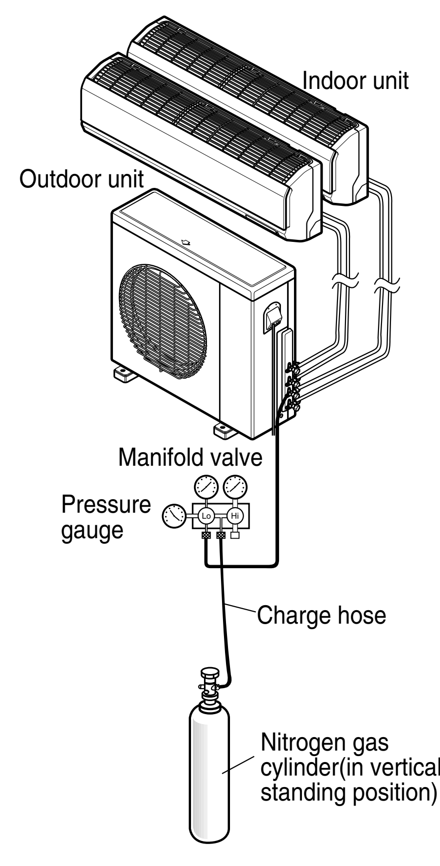
CAUTION: Be sure to use a manifold valve for leak testing.
The high side manifold valve must always be kept closed.

• Pressurize the system to no more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reached 150 P.S.I.G. Next, test for leaks with liquid soap.

CAUTION: To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

NOTICE : Leakage testing shoud be done for each indoor unit connection set, separately.

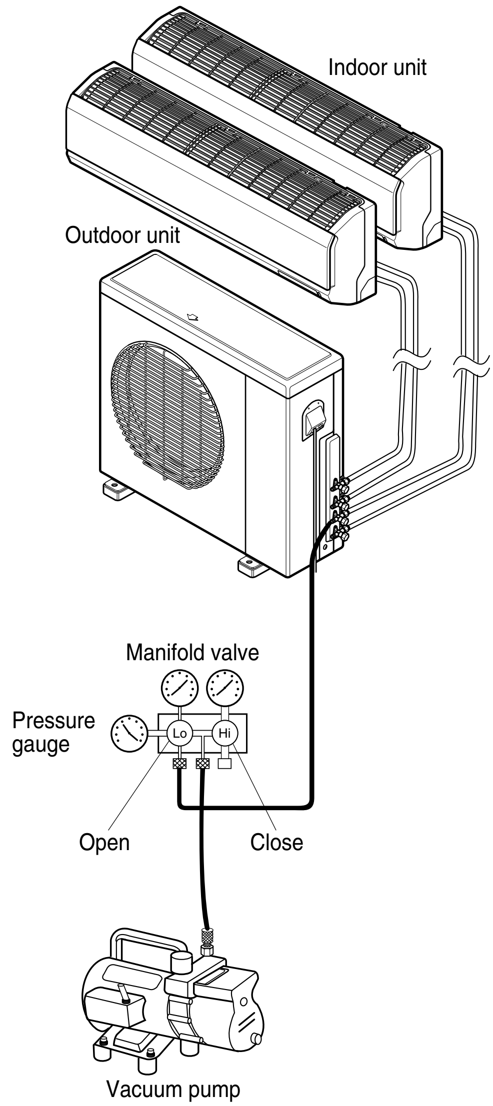
1. Do a leakage test of all joints of the copper piping(both indoor and outdoor) and both gas and liquid side service valves.
   Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.
2. After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.



Evacuation

1. Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit.
   Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump.
   The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.

Required time for evacuation when 4 CFM vacuum pump is used	
If tubing length is less than 10m (33 ft)	If tubing length is longer than 10m (33 ft)
10 min. or more	15 min. or more



2. When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.

Finishing the job

1. With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
2. Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
3. Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
4. Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
5. Replace the valve caps at both gas and liquid side service valves and fasten them tight.

This completes air purging with a vacuum pump.

The air conditioner is now ready for test running.

NOTICE

: Repeat evacuation procedure for each indoor unit.

Charging

- Each outdoor unit is factory charged (see rating plate) for the evaporator as well as a 7.5m(25ft) line set for each indoor line. Any time the total line set is used either shorter or longer then the nominal line set length the refrigerant charge has to be adjusted.
- Whether the line set is made shorter or longer you must adjust the charge based on how many m(ft) of tubing are either added or removed based on 20g(0.22oz) of R-410A per meter(foot).

Capacity (Btu/h)	Max total length of all pipes (A+B)	Max length of each pipe (A/B)	Min length of each pipe (A/B)	Max Elevation between each indoor unit and outdoor unit (h1)	Max elevation between indoor units (h2)	Additional Refrigerant
18k	30m(100ft)	15m(50ft)	3m(10ft)	7.5m(25ft)	7.5m(25ft)	20g/m(0.22oz/ft)
24k	30m(100ft)	15m(50ft)	3m(10ft)	7.5m(25ft)	7.5m(25ft)	20g/m(0.22oz/ft)

Capacity (Btu/h)	Max total length of all pipes (A+B+C)	Max length of each pipe (A/B/C)	Min length of each pipe (A/B/C)	Max Elevation between each indoor unit and outdoor unit (h1)	Max elevation between indoor units (h2)	Additional Refrigerant
36k	45m(150ft)	15m(50ft)	3m(10ft)	7.5m(25ft)	7.5m(25ft)	20g/m(0.22oz/ft)

Example: A 80ft line set is used for tri-zone, an additional 5 ft X 0.22 ounces per foot= add 1.1 ounces of R-410A

Important:

If you are ever uncertain of the unit charge, reclaim, evacuate and weigh in the correct charge using the charge amount specified on the unit's rating plate, adjusting for line sets longer or shorter than 7.5m(25ft) for each indoor unit. Unit is critically charged.

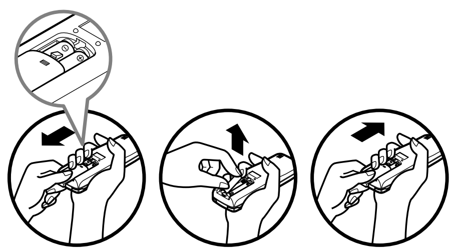
Test Running

Split Type

1. Check that all copper piping and wiring has been properly connected.
2. Check that the gas and liquid side service valves are fully open.

1) Prepare remote controller

❶ Remove the battery cover by pulling it according to the arrow direction.
❷ Insert new batteries making sure that the (+) and (–) of battery are installed correctly.
❸ Reattach the cover by pushing it back into position.



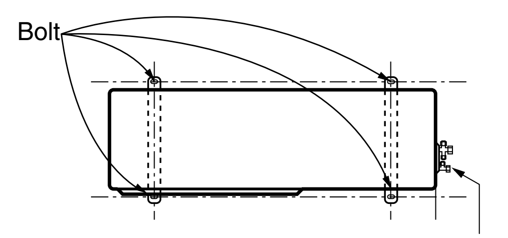
NOTE:
- Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote controller if the system is not going to be used for a long time.

2) Precautions in test run

- The initial power supply must provide at least 90% of the rated voltage.
  Otherwise, the air conditioner should not be operated.
- First operate the unit in cooling, even if you are testing the unit in the winter/heating season.
  Operating the unit in heating first during the test run can cause compressor trouble.
- Carry out the test run more than 5 minutes without failure. (Test run will be cancelled 18 minutes later automatically)
- The test run is started by pressing timer cancel button five times continuously.
- To cancel the test run, press any button.

3) Settlement of outdoor unit

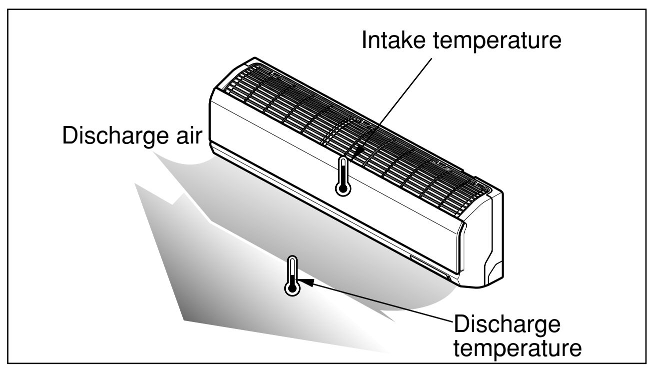
- Anchor the outdoor unit with a bolt and nut(ø10mm/0.4inch) tightly and horizontally on a concrete or rigid mount.
- When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- If the vibration from the unit is being transferred to the indoor unit via the connection of the condensation hose and/or copper tubing, secure the outdoor unit with anti-vibration rubber grommets.



4) Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:
1. Measure the pressure of the gas side service valve.
2. Measure the temperature of the intake and discharge of air.
3. Ensure the difference between the intake temperature and the discharge is more than 8°C(14.4°F) (Cooling) or reversely (Heating).

Refrigerant	Outside ambient TEMP.	The pressure of the gas side service valve.
R-410A	35°C (95°F)	8.5~9.5kg/cm^{2}G(120~135 P.S.I.G.)



Operation

Function of control

1. MAIN UNIT FUNCTION

• DISPLAY

Operation Indicator

• On while in appliance operation, off while in appliance pause
• Flashing if unit is disconnected or has experienced a short in the thermistor (3 seconds off/0.5 sec on).

Sleep Timer Indicator

• On while in sleep time mode, off when sleep timer mode is canceled or appliance operation is paused.

Timer Indicator

• On while in timer mode (on/off), off when timer mode is completed or canceled

Defrost Indicator

• Off except when units is in hot start mode (heat pump model only) or while unit is running in defrost control mode.

■ Cooling Mode Operation

• When the intake air temperature reaches 0.5°C(0.9°F) below the set point temp, the compressor and the outdoor fan stop.
• When it reaches 0.5°C(0.9°F) above the set point temp, they start to operate again.
Compressor ON Temp ➲ Set point Temp+0.5°C(0.9°F)
Compressor OFF Temp ➲ Set point Temp-0.5°C(0.9°F)
• While the compressor is running, operating with the airflow speed set by the remote control. While compressor is off, fan operates at low speed regardless of the set point.

■ Soft Dry Operation Mode

• When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the set point temp is automatically set according to the intake air temperature.
26°C(78.8°F) ≤ Intake Air Temp ➲ 25°C(77°F)
24°C(75.2°F) ≤ Intake Intake Air Temp<26°C(78.8°F) ➲ Intake Air Temp-1°C(30.2°F)
18°C(64.4°F) ≤ Intake Intake Air Temp<24°C(75.2°F) ➲ Intake Air Temp-0.5°C(31.1°F)
Intake Air Temp<18°C(64.4°F) ➲ 18°C(64.4°F)
• While the compressor is off, the indoor fan repeats low airflow speed and stop.
• While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.
Compressor ON Temp. ➲ Set point Temp+0.5°C(0.9°F)
Compressor OFF Temp. ➲ Set point Temp-0.5°C(0.9°F)
• In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

• When the intake air temp reaches +3°(37.4°F)…above the set point temp, the compressor is turned off. When below the set point temp, the compressor is turned on.
Compressor ON Temp. ➲ Set point Temp.
Compressor OFF Temp. ➲ Set point Temp.+3°C(37.4°F)
• While compressor is on, the indoor fan is off when the indoor pipe temp. is below 20°C(68°F), when above 27°C(80.6°F) , it operates at low speed. When the indoor pipe temp is between 20°C(68°F) and 27°C(80.6°F), it

operates (except in sleep mode, the airflow will be at medium speed).
- While compressor is off, the indoor fan is off when the indoor pipe temp is below 33°C(91.4°F), when above 35°C(95°F) , it operates with the low airflow speed.
- While in defrost mode, the indoor and outdoor fans are turned off.

■ Defrost Control(Heating)

- While in defrost mode, the indoor and outdoor fans are turned off.
- Defrost operation is controlled by timer and sensing temperature of the outdoor pipe.
- The first defrost cycle starts only when the outdoor pipe temperature falls below -6°C (21.2° F) after 35 minutes has passed from the start of the heating operation and more than 4 minutes since the last of operation of the compressor.
- Defrost ends after 12 minutes passed from starting of defrost operation when the outdoor pipe temperature rises over 15°C(59°F) even before 12 minutes.
- The second defrost cycle starts only when the outdoor pipe temperature falls below -6°C(21.2°F) after 35 minutes passed from ending the second defrost cycle and more than 4 minutes since the last operation of the compressor.

■ Fuzzy Operation

- When the unit is turned on and an operation mode has not been selected, after 3 hours has passed, the operation mode will be automatically selected via fuzzy operation.
- When determining the operation mode, the compressor, the outdoor fan, and the 4 way valve are off and only the indoor fan is operated for 15 seconds. Then an operation mode is selected according to the intake air temp at that moment as follows.

24°C(75.2°F) ≤ Intake Air Temp	➲ Fuzzy Operation for Cooling
21°C(69.8°F) ≤ Intake Air Temp<24°C(75.2°F)	➲ Fuzzy Operation for Dehumidification
Intake Air Temp<21°C(69.8°F)	➲ Fuzzy Operation for Heating

- However, if any of the operation modes among cooling / dehumidification / heating mode operations has been carried out for 10 sec or longer before Fuzzy operation, the last mode that the unit operated in will be automatically selected.

1) Fuzzy Operation for Cooling

- According to the set point temperature selected by Fuzzy rule, when the intake air temp is 0.5°C(0.9°F) or more below the set point temp, the compressor is turned off. When 0.5°C(0.9°F) or more above the set point temp, the compressor is turned on.

Compressor ON Temp	➲ Set point Temp +0.5°C(0.9°F)
Compressor OFF Temp	➲ Set point Temp + 0.5°C(0.9°F)

- At the beginning of Fuzzy mode operation, the set point temperature is automatically selected according to the intake air temp at that time.

26°C(78.8°F)≤ Intake Air Temp	➲ 25°C(77°F)
24°C(75.2°F)≤ Intake Air Temp<26°C(78.8°F)	➲ Intake Air Temp + 1°C(1.8°F)
22°C(71.6°F)≤ Intake Air Temp<24°C(75.2°F)	➲ Intake Air Temp + 0.5°C(0.9°F)
18°C(64.4°F)≤ Intake Air Temp<22°C(71.6°F)	➲ Intake Air Temp
Intake Air Temp<18°C(64.4°F)	➲ 18°C(64.4°F)

- When the Fuzzy key (Temperature Control key) is input after the initial set point temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the set point temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

2) Fuzzy Operation for Dehumidification

- According to the set point temperature selected by Fuzzy rule, when the intake air temp is 0.5°C(0.9°F) or more below the set point temp, the compressor is turned off. When 0.5°C(0.9°F) or more above the set point temp, the compressor is turned on.

  Compressor ON Temp ➲ Set point Temp + 0.5°C(0.9°F)
  Compressor OFF Temp ➲ Set point Temp+0.5°C(0.9°F)
- At the beginning of Fuzzy mode operation, the set point temperature is automatically selected according to the intake air temp at that time.

  26°C(78.8°F) ≤ Intake Air Temp ➲ 25°C(77°F)
  24°C(75.2°F) ≤ Intake Air Temp<26°C(78.8°F) ➲ Intake Air Temp+1°C(1.8°F)
  22°C(71.6°F) ≤ Intake Air Temp<24°C(75.2°F) ➲ Intake Air Temp+0.5°C(0.9°F)
  18°C(64.4°F) ≤ Intake Air Temp<22°C(71.6°F) ➲ Intake Air Temp
  Intake Air Temp<18°C(64.4°F) ➲ 18°C(64.4°F)
- When the Fuzzy key (Temperature Control key) is input after the initial set point temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the set point temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan repeats the low airflow speed or , except in dehumidification mode where the indoor fan may pause.

3) Fuzzy Operation for Heating

- According to the set point temperature selected by Fuzzy rule, when the intake air temp is 3°C(37.4°F) or more above the set point temp, the compressor is turned off. When below the set point temp, the compressor is turned on.

  Compressor ON Temp ➲ Set point Temp
  Compressor OFF Temp ➲ Set point Temp + 3°C(5.4°F)
- At the beginning of Fuzzy mode operation, the set point temperature is automatically selected according to the intake air temp at that time.

  20°C(68°F)≤Intake Air Temp ➲ Intake Air Temp + 0.5°C(0.9°F)
  Intake Air Temp<20°C(68°F) ➲ 20°C(68°F)
- When the Fuzzy key (Temperature Control key) is input after the initial set point temperature is selected, the Fuzzy key value and the intake air temperature at that time are compared to select the set point temperature automatically according to the Fuzzy rule.
- While in Fuzzy operation, the airflow speed of the indoor fan is set to the high or medium according to the intake air temperature and the set point temperature.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or power (auto) by the input of the airflow speed selection key on the remote control.

■ On-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance starts to operate.
- The timer LED is on when the on-timer is input. It is off when the time set by the timer is reached.
- If the appliance is operating at the time set by the timer, the operation continues.

While in Fuzzy operation, the airflow speed of the indoor fan is automatically selected according to the temperature.

■ Off-Timer Operation

- When the set time is reached after the time is input by the remote control, the appliance stops operating.
- The timer LED is on when the off-timer is input. It is off when the time set by the timer is reached.

• If the appliance is paused at the time set by the timer, the pause continues.

■ Off-Timer <=> On-Timer Operation

• When the set time is reached after the on/off time is input by the remote control, the on/off-timer operation is carried out according to the set time.

■ Sleep Timer Operation

• When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
• While the appliance is paused, the sleep timer mode cannot be input.
• While in cooling mode, 30 min later the start of the sleep timer, the set point temperature increases by 1°C(33.8°F). After another 30 min elapse, it increases by 1°C(1.8°F) again.
• When the sleep timer mode is input while in cooling mode, the airflow speed of the indoor fan is set to the low.
• When the sleep timer mode is input while in heating mode, the airflow speed of the indoor fan is set to the medium.

■ Chaos Swing Mode

• By the Chaos Swing key input, the upper/lower vane automatically operates with the Chaos Swing or they are fixed to the desired direction.
• While in Chaos Swing mode, the angles of cooling and heating cycle operations are different.

■ Chaos Natural Wind Mode

• When the Chaos Natural Wind mode is selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation.

■ Jet Cool Mode Operation

• While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in cooling, dehumidification, ventilation the Jet Cool mode is operated.
• In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min in cooling mode.
• In the Jet Cool mode operation, the room temperature is controlled to the set point temperature, 18°C(64.4°F).
• When the sleep timer mode is input while in Jet Cool mode, Jet Cool mode has the priority.
• When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Auto Restarting Operation

• When the power is restored after a sudden power failure the appliance is in operation, the mode before the power failure is kept in the memory. Because of this feature, the appliance automatically operates in the mode on the memory.

■ Forced Operation

- To operate the appliance by force (in case the remote control is lost), the forced operation selection switch is on the main unit of the appliance and operates it in standard conditions.
- When the power is supplied while the slide switch is in the forced operation position, or the Auto Restart (or test operation) position or switched from the remote control position to the forced operation position while the power is on, the forced operation is carried out.
- When the slide switch position is switched from the forced operation position to the Auto Restarting position or the remote control position, the forced operation is canceled and the appliance stops operating.
- In the forced operation mode, the indoor fan is operated at low speed for 15 sec and then the operation condition is set according to the intake air temperature as follows.

24°C(43.2°F)≤Intake Air Temp	➲ Cooling Mode Operation, 22°C(39.6°F), High Speed
21°C(37.8°F)≤Intake Air Temp<24°C(43.2°F)	➲ Dehumidification Operation, 23°C(41.4°F), High Speed
Intake Air Temp<21°C(37.8°F)	➲ Heating Mode Operation, 24°C(43.2°F), High Speed

■ Buzzer Sound

- When the appliance-operation key is input by the remote control, the short "beep-beep-" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.

Function of Indoor Unit

Split Type Indoor Unit

Operation ON/OFF by Remote controller

Sensing the Room Temperature

- Room temperature sensor. (THERMISTOR)

Room temperature control

- Maintains the room temperature in accordance with the set point Temp.

Starting Current Control

- Indoor fan is delayed for 5 seconds at the starting.

Time Delay Safety Control

- Restarting is delayed for approx. 3 minutes.

Indoor Fan Speed Control

- High, Med, Low, Chaos, Jet Cool

Operation indication Lamps (LED)

ⓘ	**On/Off**	: Lights up during the system operation.
☆	**Sleep Mode**	: Lights up during Sleep Mode Auto operation.
◷	**Timer**	: Lights up during Timer operation.
❄	**Defrost Mode**	: Lights up during Defrost Mode or Hot Start operation (Heat pump model only)
	Outdoor unit operation	: Lights up during outdoor unit operation.(Cooling model only)
88°C	**Desire temperature indicator**	For cooling,dehumidification,heating modes it display Destired temperature

• Cooling	: 18°C~30°C(64°F~86°F)	• AI	: Auto Operation
• Dehumidification	: 18°C~30°C(64°F~86°F)	• Po	: Jet Cool
• Heating	: 16~30°C(60°F~86°F)	• Lo	: Test Mode

Soft Dry Operation Mode

- Intermittent operation of fan at low speed.

Sleep Mode Auto Control

- The fan is switched to low(Cooling), med(Heating) speed.
- The unit will be stopped after user selected1, 2, 3, 4, 5, 6, 7 hours.

Natural Air Control by CHAOS Logic

- The fan is switched to intermittent or irregular operation
- The fan speed is automatically switched from high to low speed.

* Airflow Direction Control

- The louver can be set at the desired position or swing up and down automatically.(Model base)

De-Ice or Defrost Control (Heating)

- Both the indoor and outdoor fans stop during de-icing.
- Hot start after de-Ice ends.

Hot-start Control (Heating)

- The indoor fan stops until the evaporator piping temperature reaches 27°C(80.6°F).

"Wall Mounted Type is standard"
* Functions is dependent on model type.

Function of Outdoor Unit

Outdoor Unit

Operating Step

• Compressor step varies considering conditions such as room temperature, operating room number, temperature gap between room temperature and set point temperature and so on.

LEV Control

• The linear expansion valve is pulse is modulated to keep constant superheat or subcooling.

Outdoor Fan Control

• Outdoor fan operates at High or Off to respond to the load condition.

R/Valve Control(Heating Model Only)

• Reversing valves is used to change cooling to heating, heating to cooling.

Defrost Function

• After 45 minutes in heating mode, defrost mode will take effect if the outdoor pipe temp is below 5°C (23°F). The defrost mode will end when the outdoor pipe temp is above 12°C (53.6°F) or after the unit has been operated in cooling mode for 9 minutes.
• To de-ice the outdoor heat exchanger in low temperature conditions, the unit will defrost by changing the operating mode from heating to cooling, while turning off both indoor and outdoor fans.

Oil Return System

• In single(one) compressor operation duration, another compressor will operate for 30 seconds every 1 hours.

compressor Overload Protection

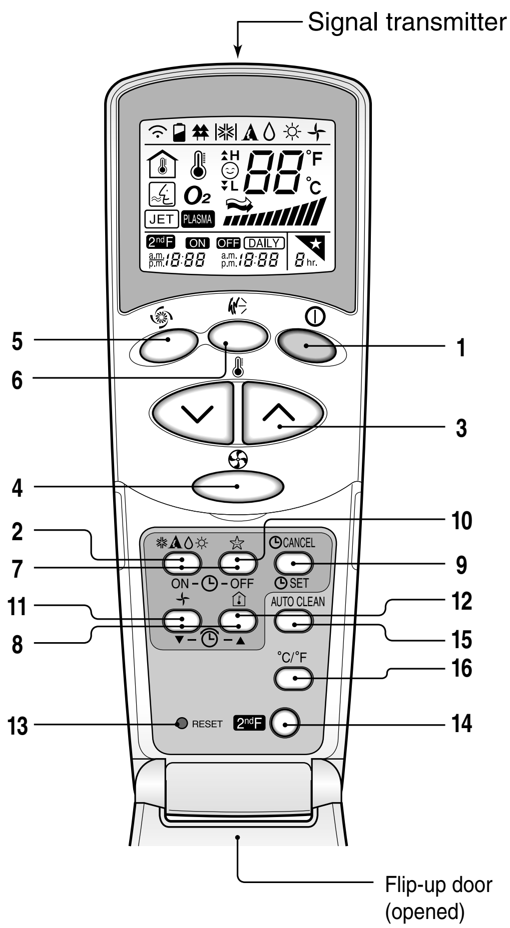
• To protect compressor from being overloaded, the compressor overload protector will turn the compressor off.

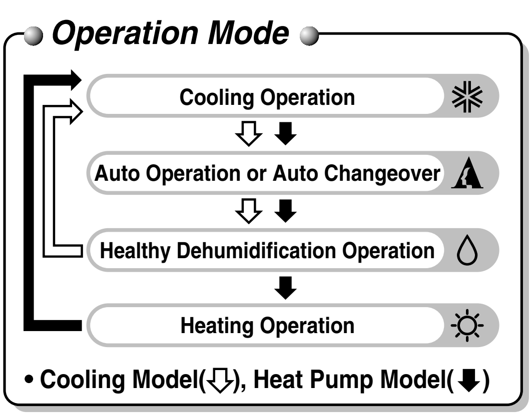
High Pressure Protction

• If the refrigerant cycle's pressure is too high, above 36.7 kgf/cm^2 (521.997psi), the high pressure switch will turn the compressor off.

Remote Control Operation

The Remote Controller transmits the signals to the system.





1. START/STOP BUTTON
Operation starts when this button is pressed and stops when the button is pressed again.

2. OPERATION MODE SELECTION BUTTON
Used to select the operation mode.
(Heat Pump) (Cooling Only)

3. ROOM TEMPERATURE SETTING BUTTONS
Used to select the room temperature.

4. INDOOR FAN SPEED SELECTOR
Used to select fan speed in four steps low, medium, high and CHAOS.

5. JET COOL
Used to start or stop the speed cooling/heating. (speed cooling/heating operates super high fan speed.)

6. CHAOS SWING BUTTON
Used to stop or start louver movement and set the desired up/down airflow direction.

7. ON/OFF TIMER BUTTONS
Used to set the time of starting and stopping operation.

8. TIME SETTING BUTTONS
Used to adjust the time.

9. TIMER SET/CANCEL BUTTON
Used to set the timer when the desired time is obtained and to cancel the Timer operation.

10. SLEEP MODE AUTO BUTTON
Used to set Sleep Mode Auto operation.

11. AIR CIRCULATION BUTTON
Used to circulate the room air without cooling or heating.

12. ROOM TEMPERATURE CHECKING BUTTON
Used to check the room temperature.

13. RESET BUTTON
Used prior to resetting time.

14. 2nd F Button
Used prior to using modes printed in blue at the bottom of buttons.

15. AUTO CLEAN
Used to set Auto Clean mode.

16. ˚C TO ˚F SWITCHING BUTTON
Used to switch temperature reading from Centigrade to Fahrenheit.

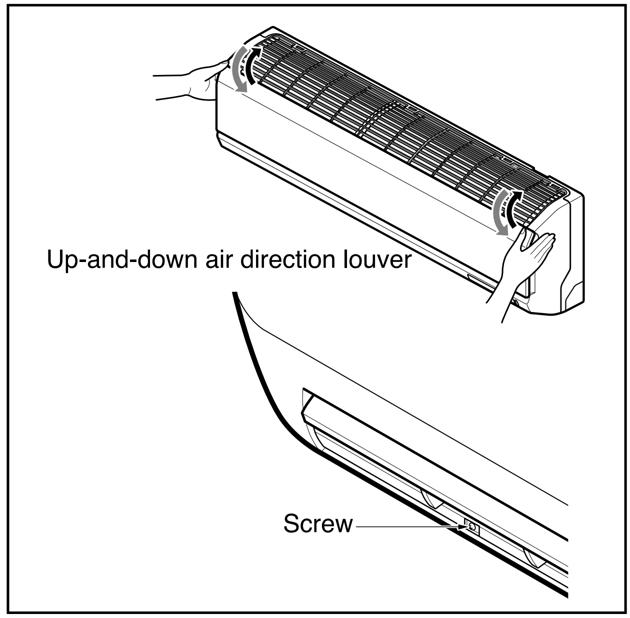
Disassembly

Indoor Unit

Split Type Indoor Unit

⚠ WARNING

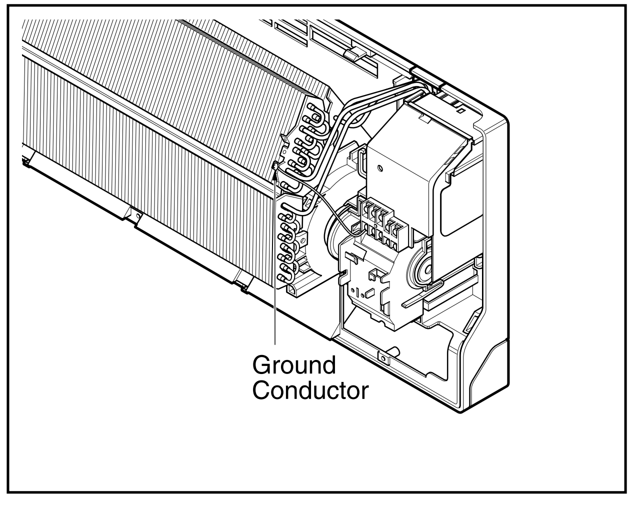
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to "OFF".



To remove the Grille from the Chassis.

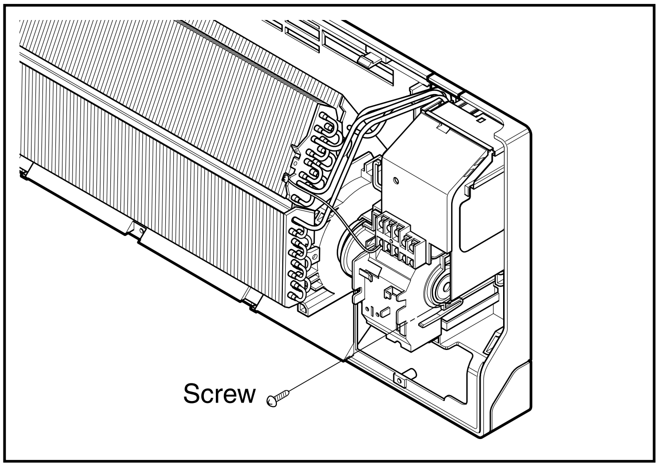
- Set the up-and-down air discharge louver to open position (horizontally) by finger pressure.
- Remove the securing screws.
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

1. Before removing the control box, be sure to take out the wire screwed at the other end.



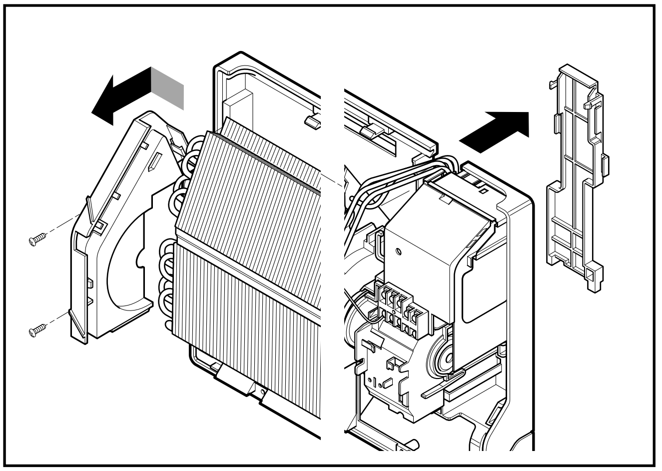
2. To remove the Control Box.

- Remove securing screws.
- Pull the control box out from the chassis carefully.



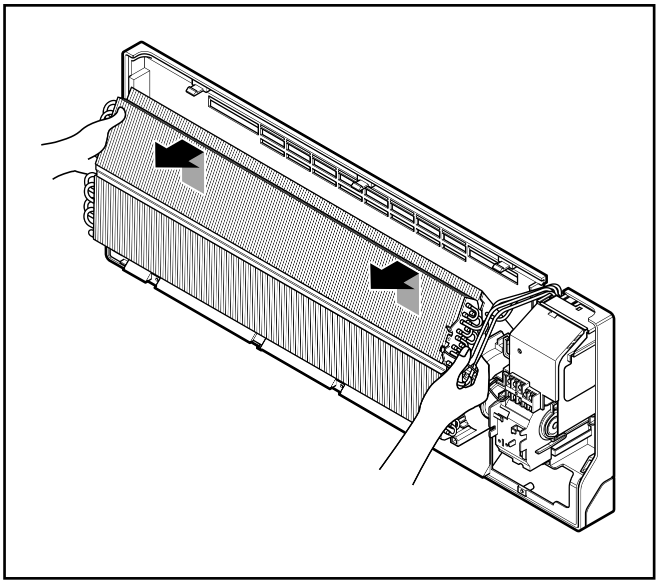
3. To remove the Discharge Grille.

- Unhook the discharge grille and pull the discharge grille out from the chassis carefully.



4. To remove the Evaporator.

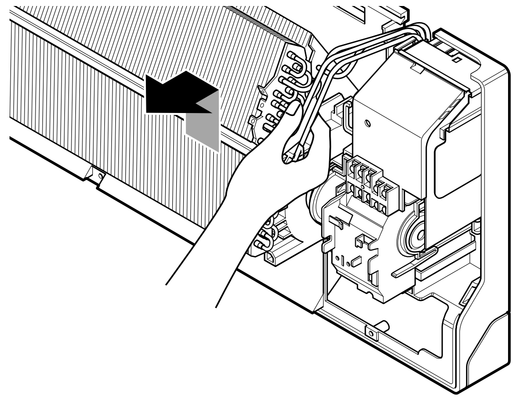
- Remove 3 screws securing the evaporator(at the left 2EA in the Evaporator Holder, at the right 1EA).



⚠ CAUTION

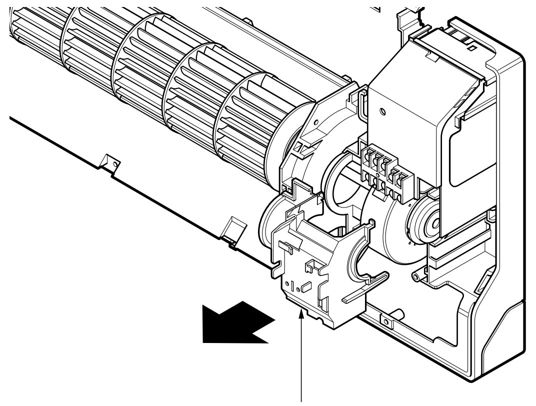
- Repairing the unit, do not damage the Caution label.

- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.



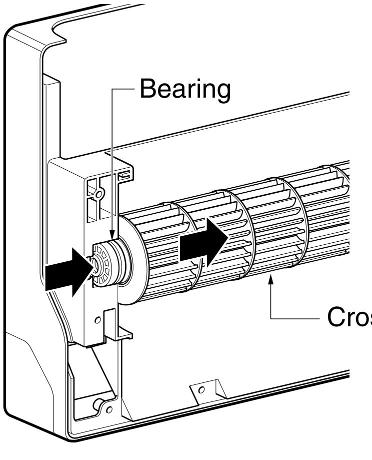
5. To remove the Motor Cover

- Remove 2 securing screws.
- Pull the motor cover out from the chassis carefully.



6. To remove the Cross-Flow Fan

- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).
- Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.



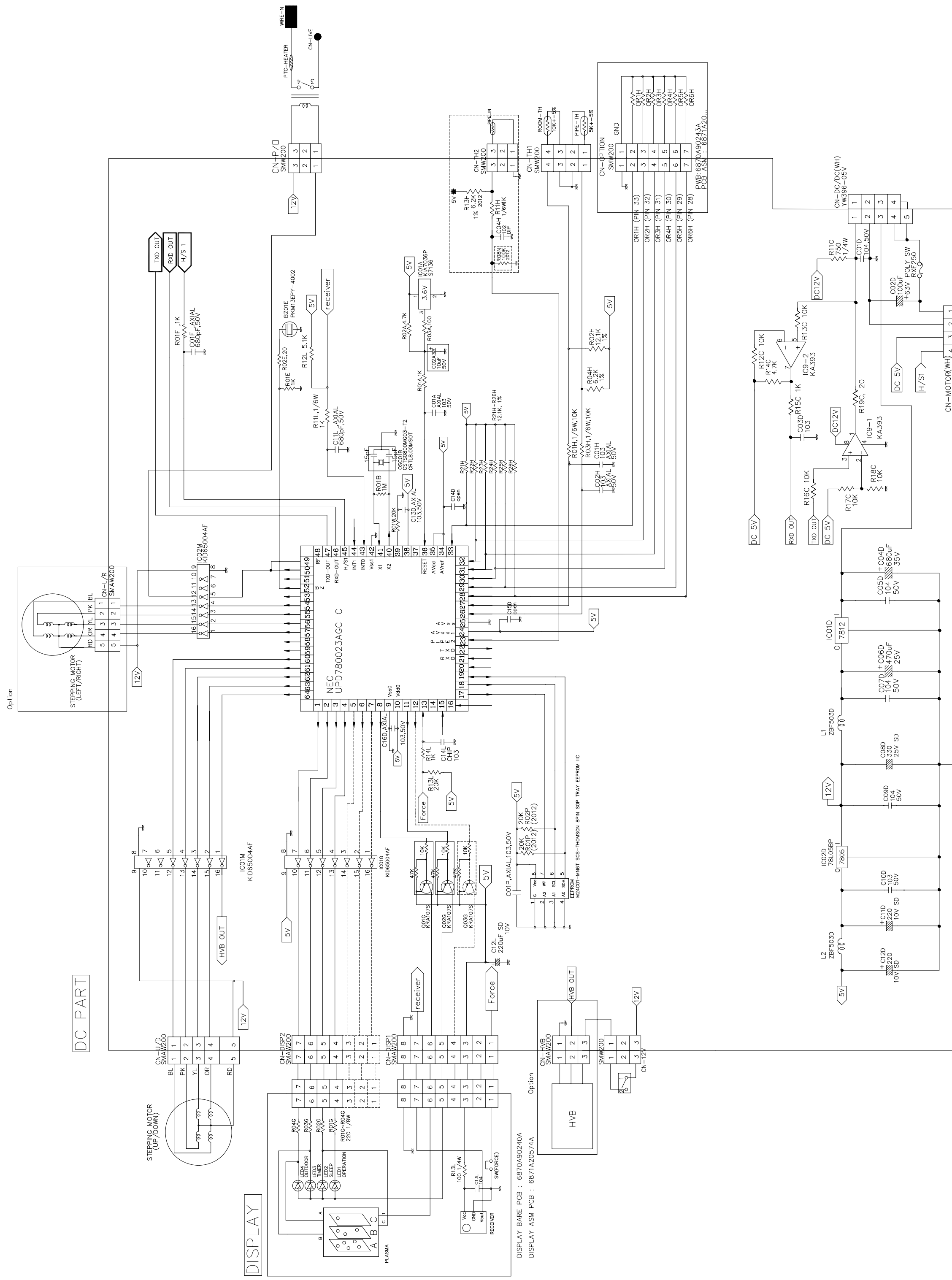
- Remove the left end of the cross-flow fan from the self-aligning bearing.

Schematic Diagram

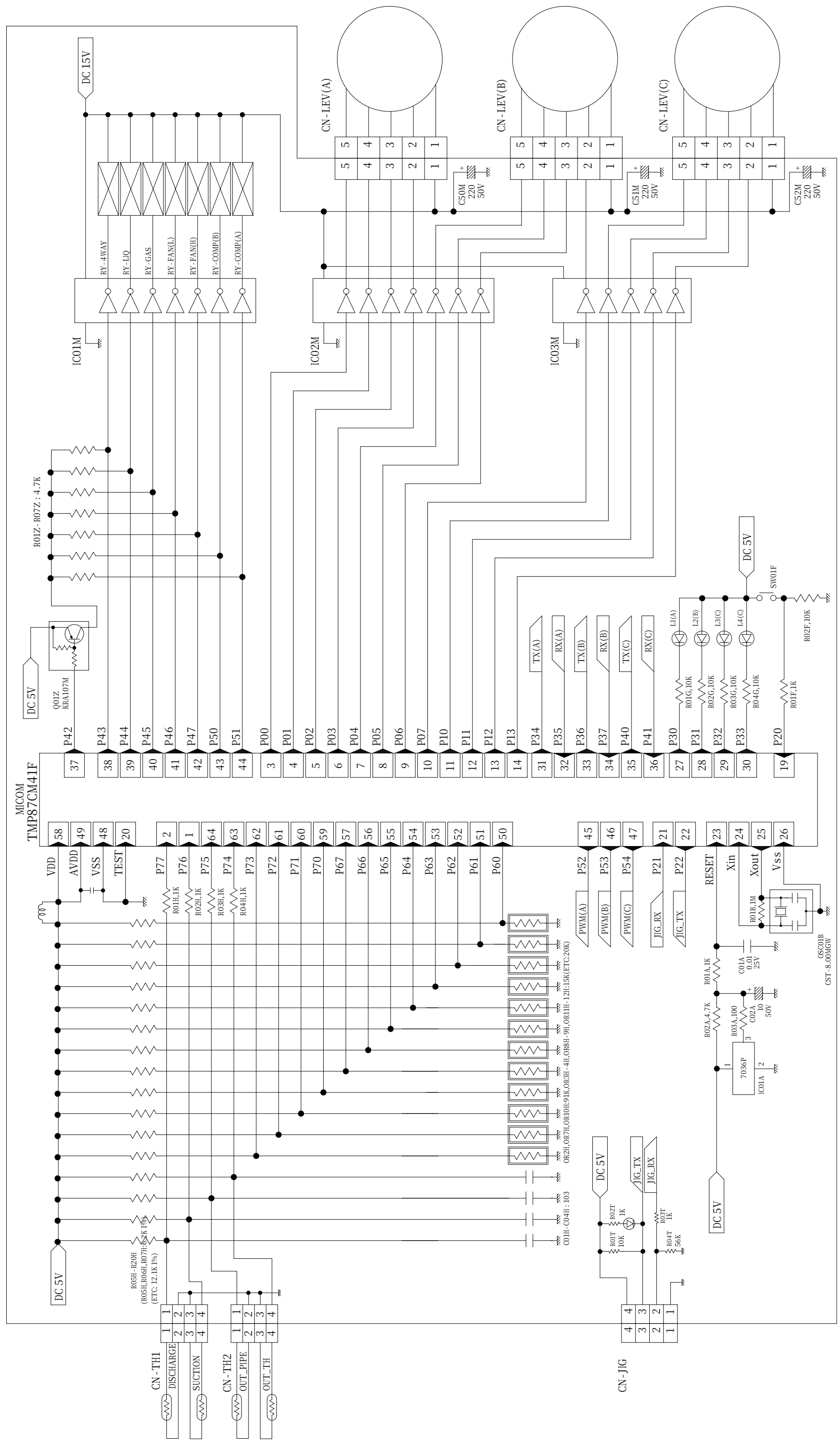
Electronic Control Device

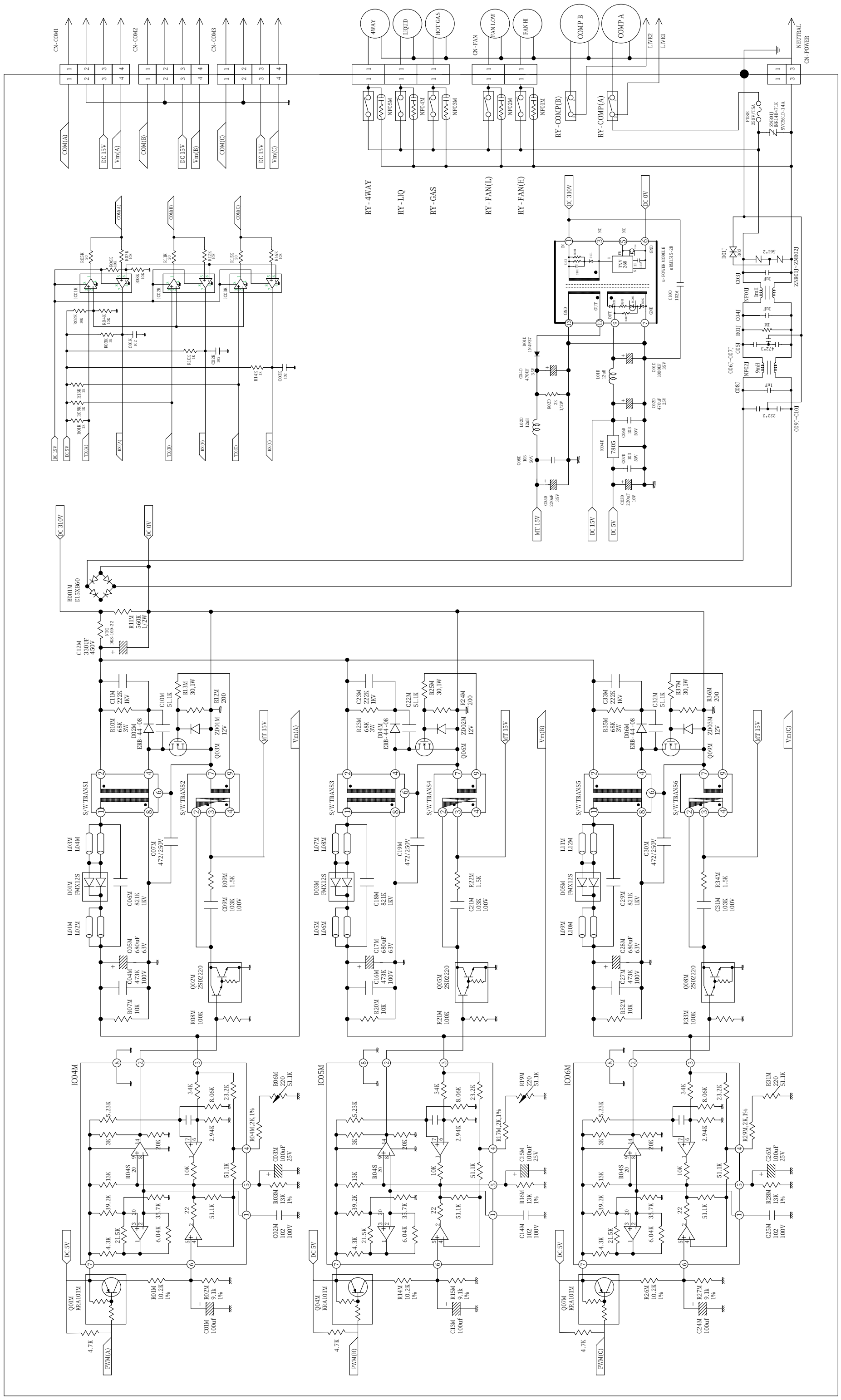
1. Indoor Unit

1) Split Type



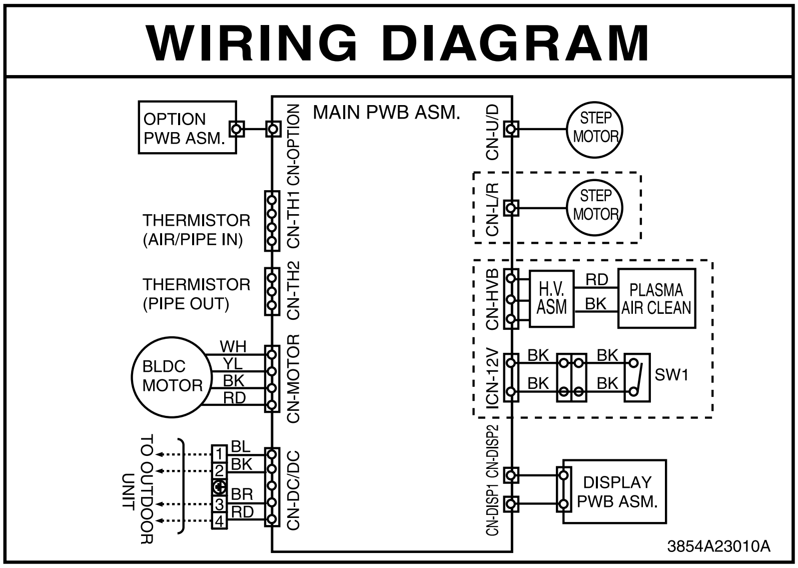
2. Outdoor Unit





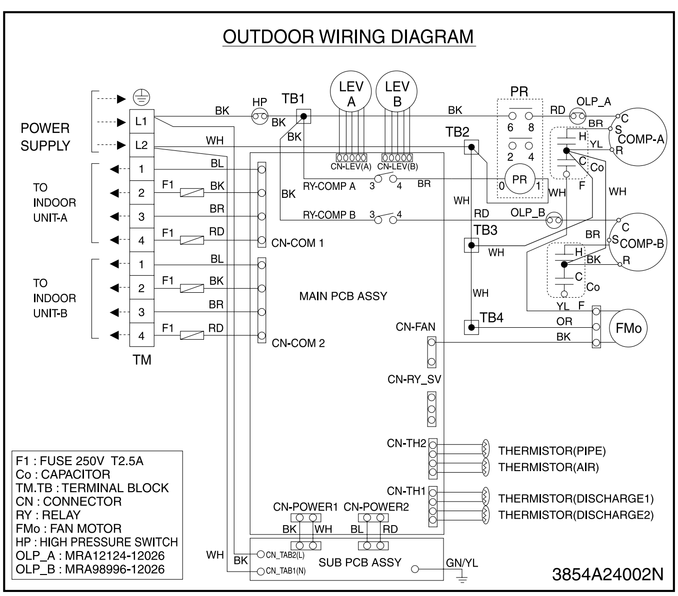
Wiring Diagram

1. Indoor Unit

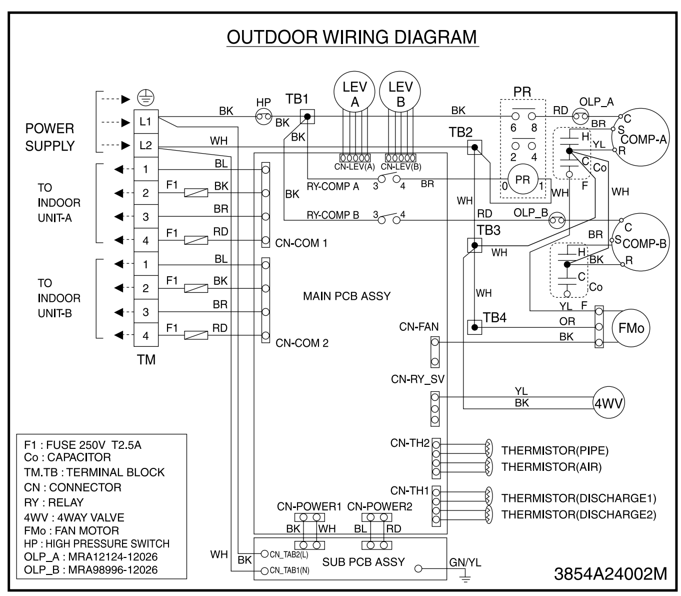


2. Outdoor Unit

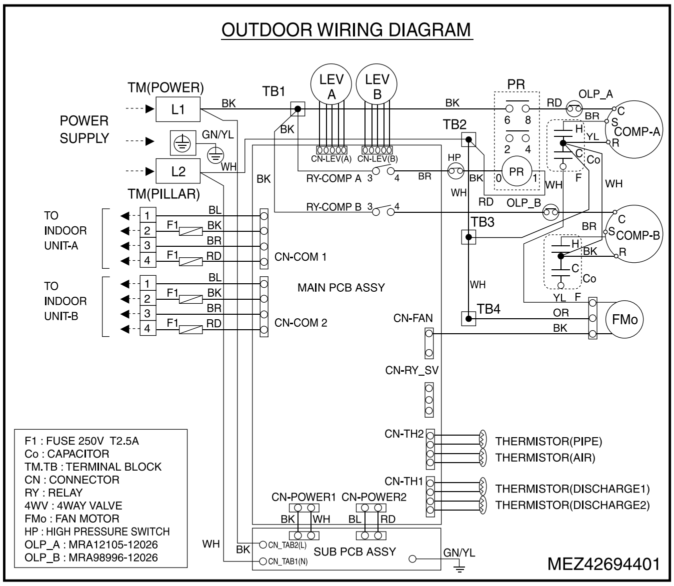
1)A-MMC18FA-1



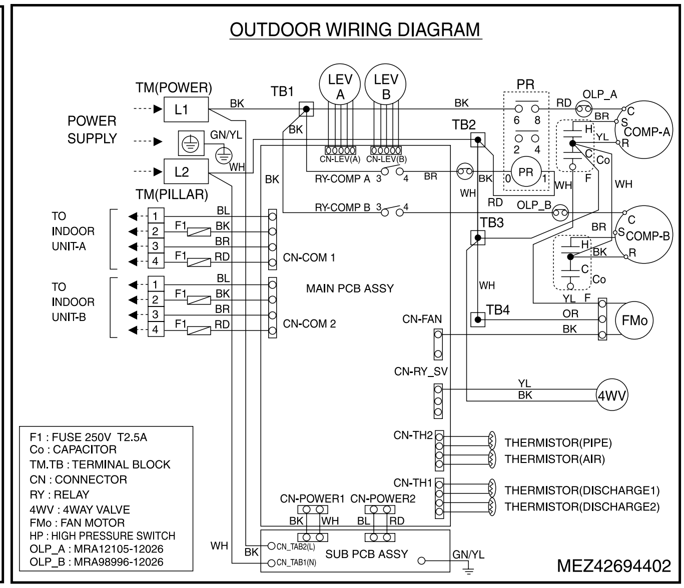
2)A-MMH18FA-1



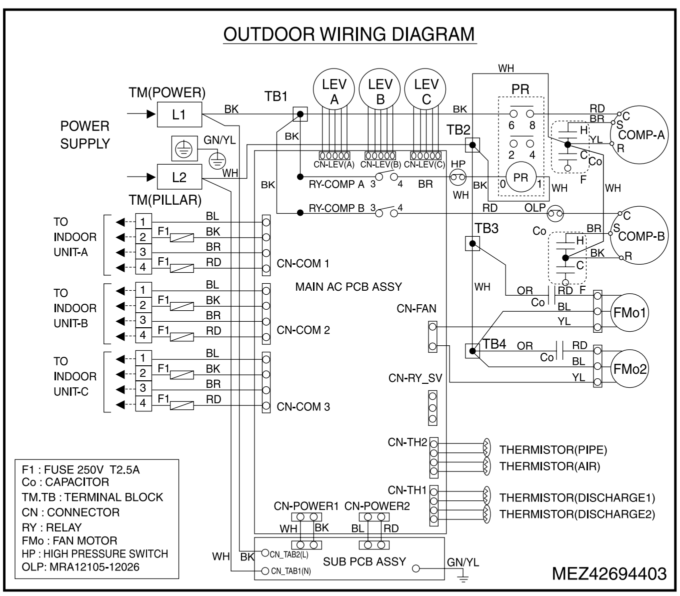
3) A-MMC24FA-1



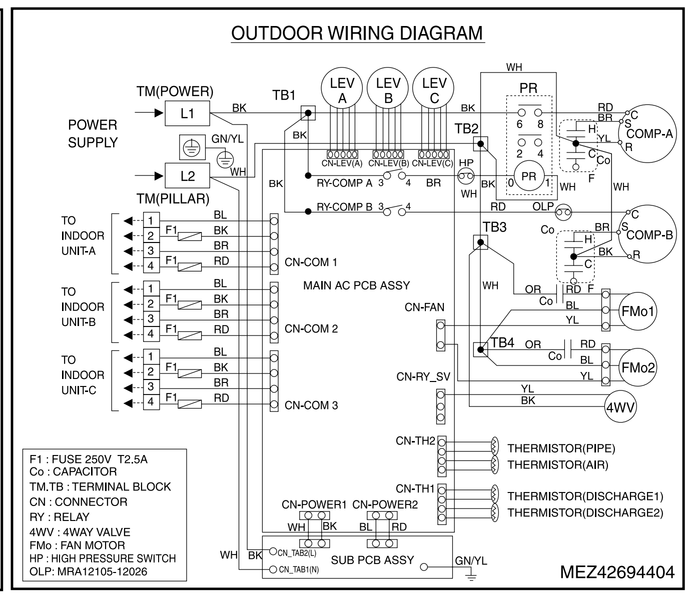
4) A-MMH24FA-1



5) A-MMC36FA-1



6) A-MMH36FA-1



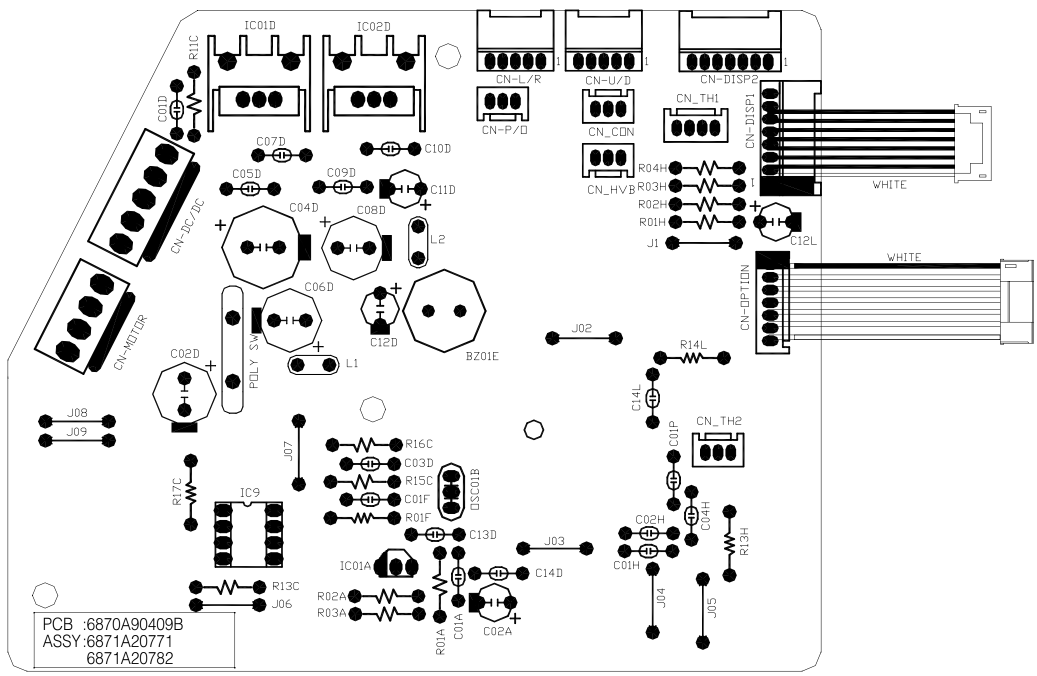
Component Locations

1. Indoor Unit

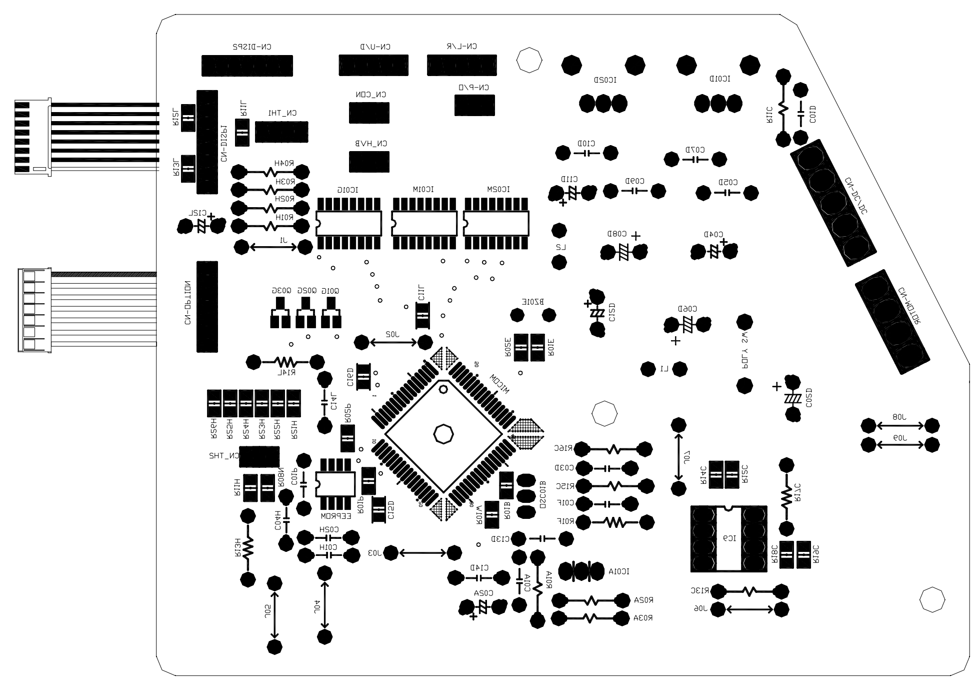
MAIN P.C.B. ASSEMBLY

1) Split Type

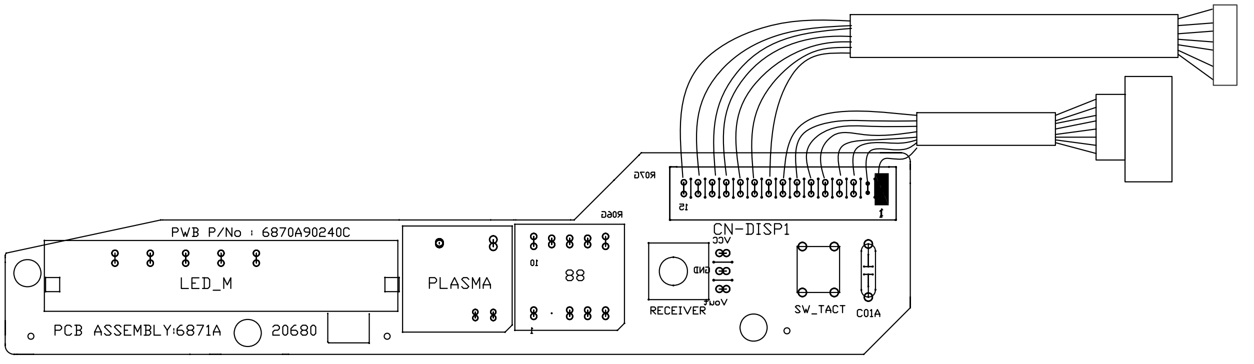
• TOP VIEW



• BOTTOM VIEW

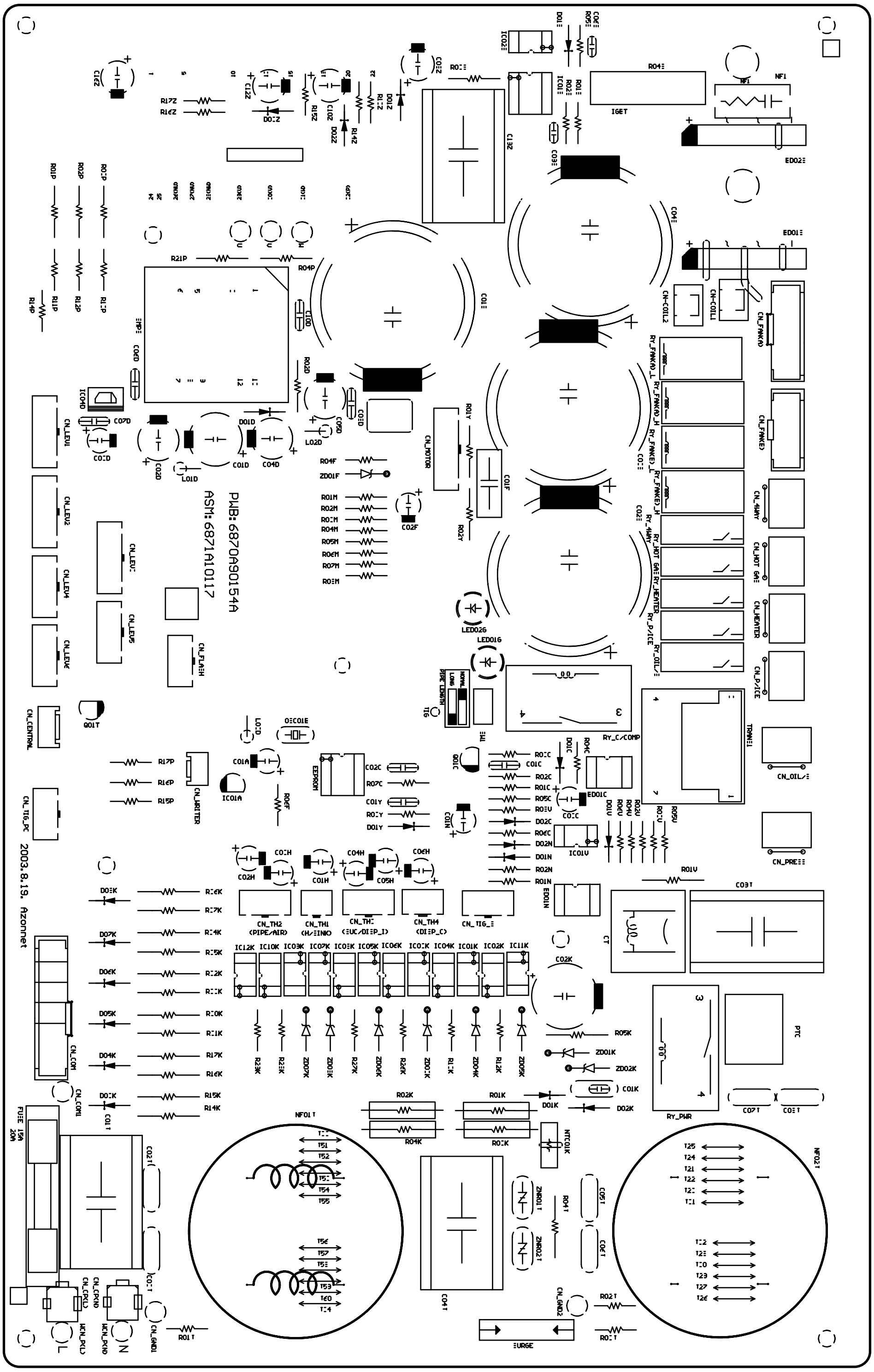


2. Display ASSEMBLY
1) Split Type (6871A20680)

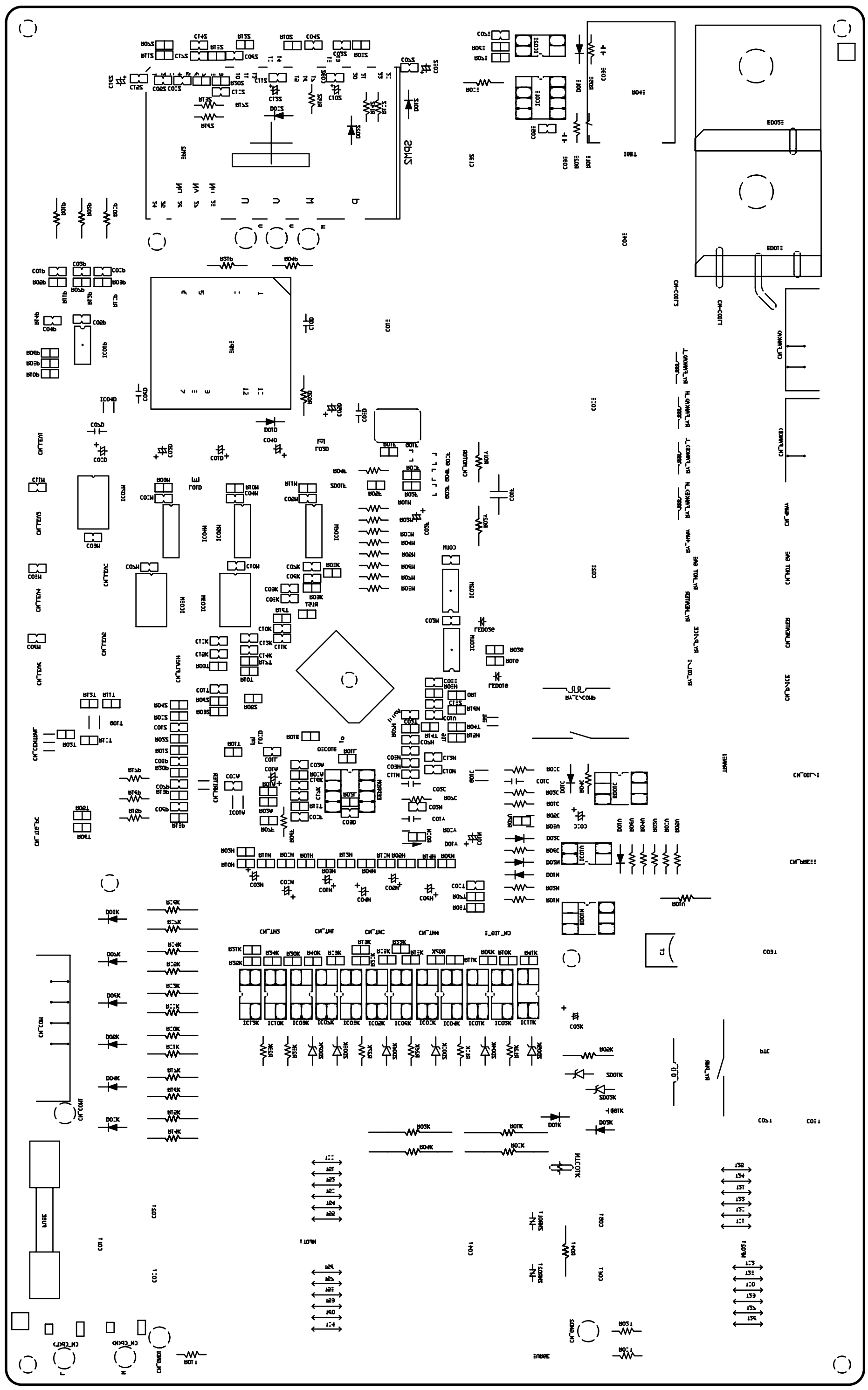


3. Outdoor Unit

1) Component side



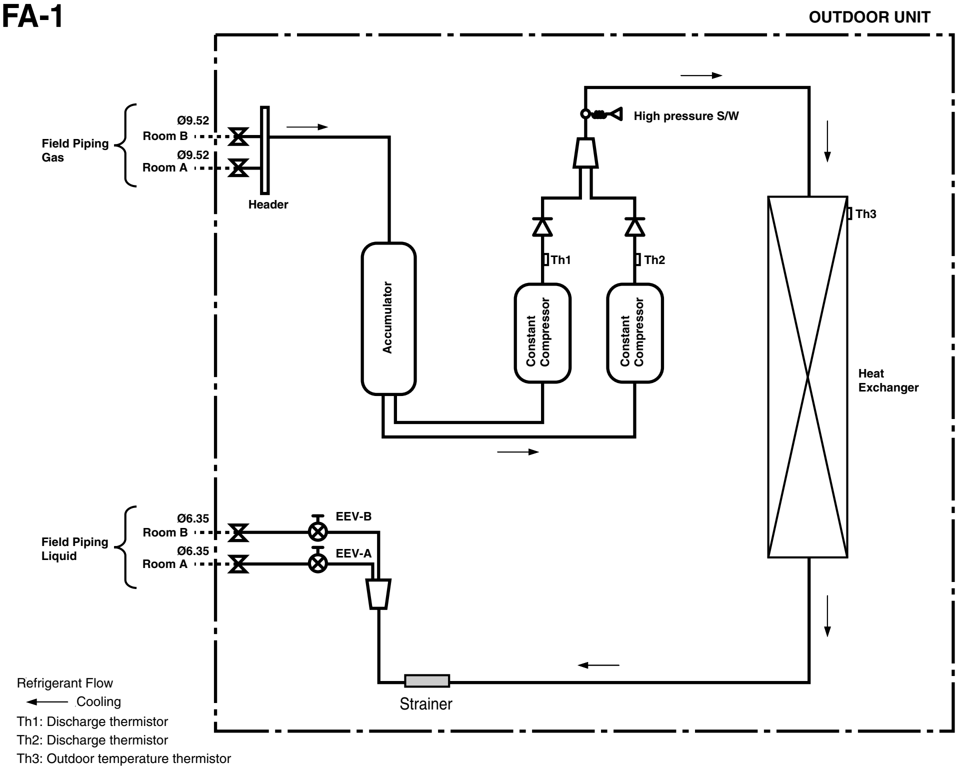
2) Solder side



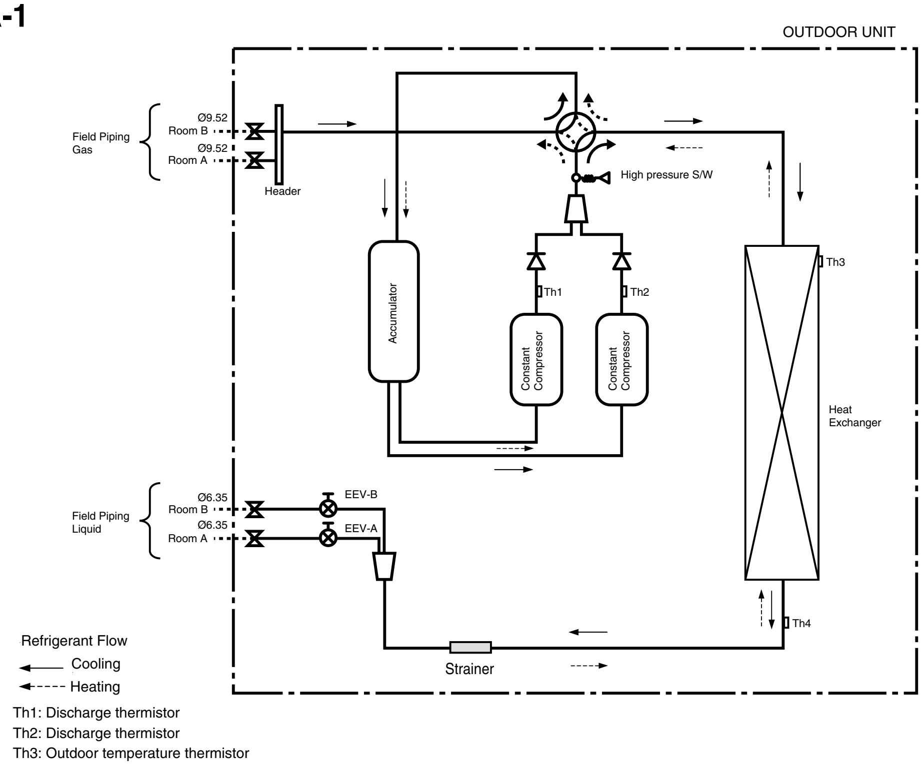
Troubleshooting Guide

Refrigeration Cycle Diagram

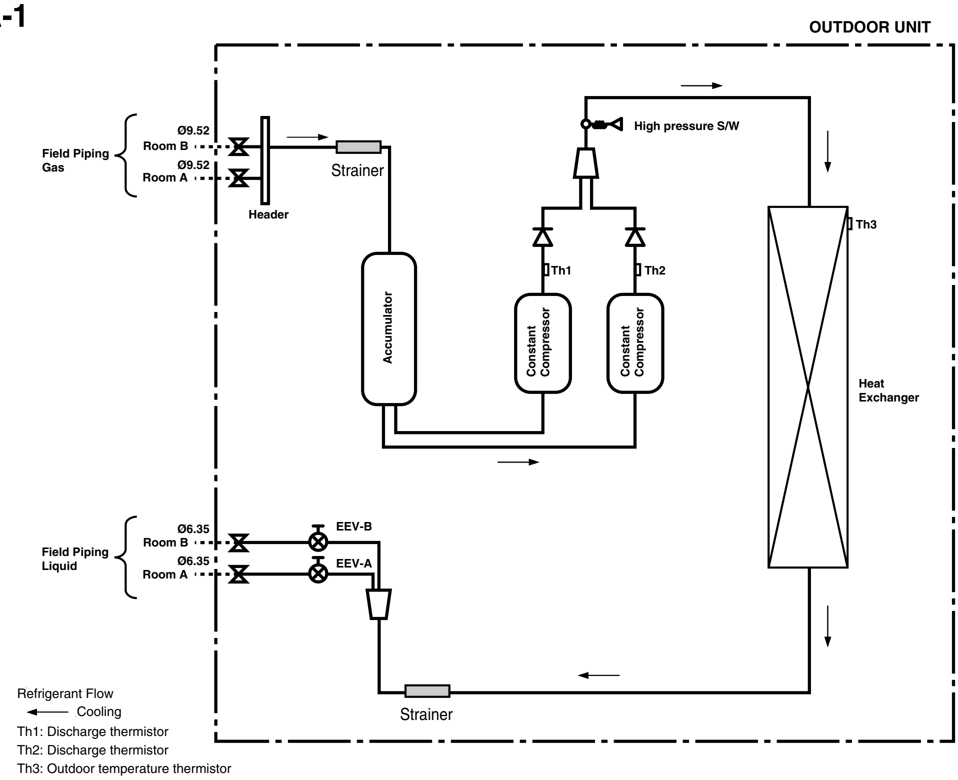
1. A-MMC18FA-1



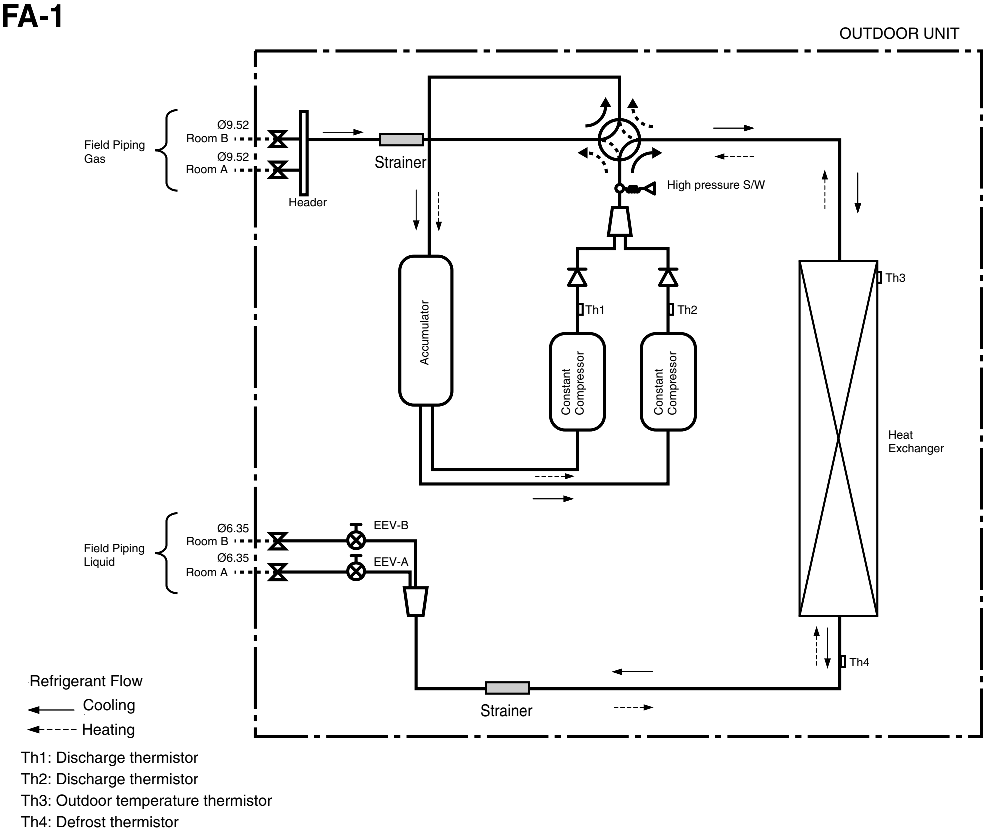
2. A-MMH18FA-1



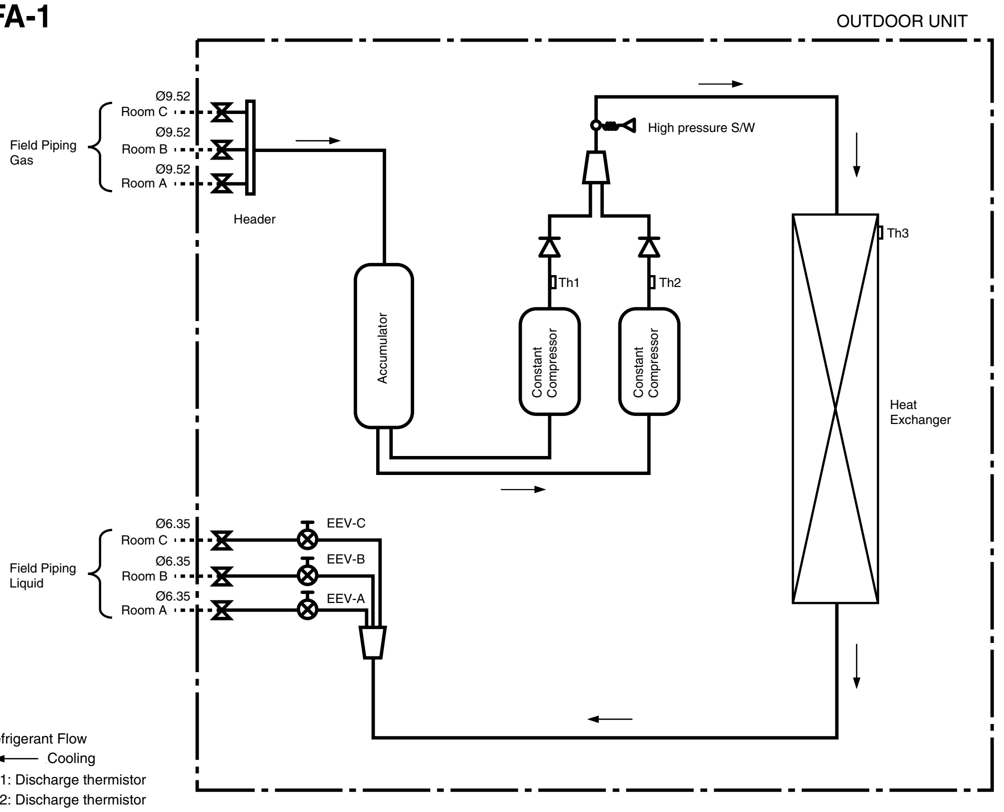
3. A-MMC24FA-1



4. A-MMH24FA-1

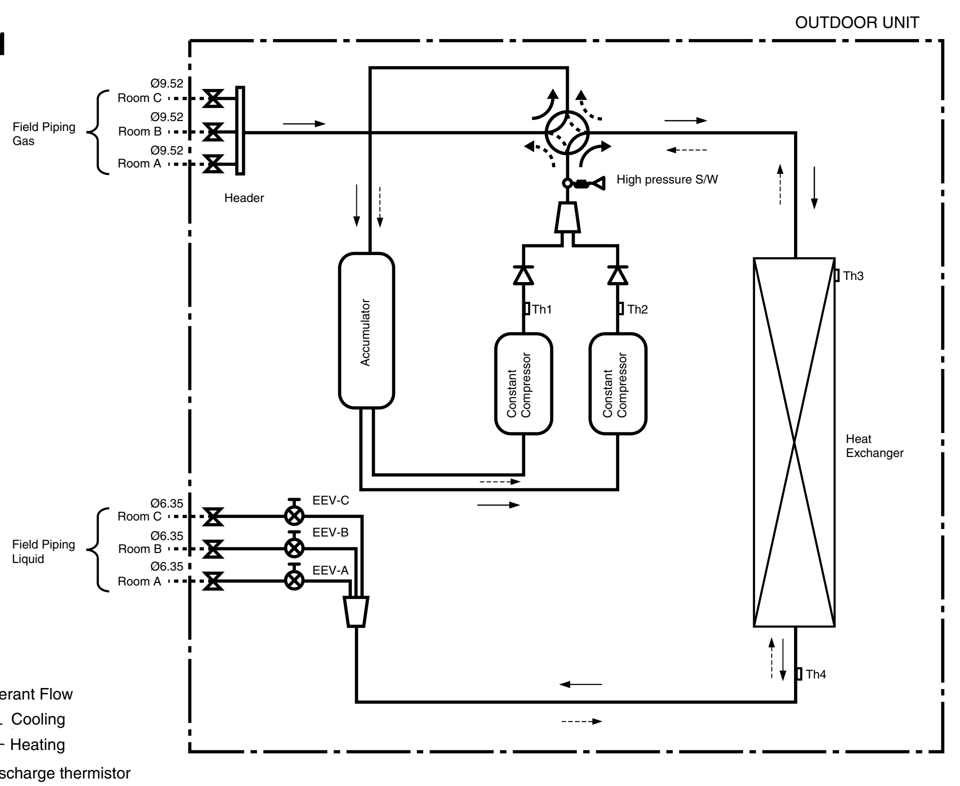


5. A-MMC36FA-1



Refrigerant Flow
Cooling
Th1: Discharge thermistor
Th2: Discharge thermistor
Th3: Outdoor temperature thermistor

6. A-MMH36FA-1

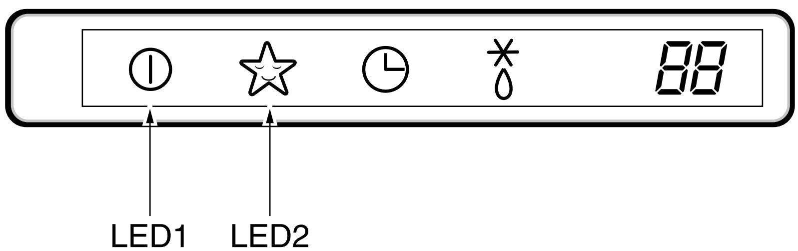


Refrigerant Flow
Cooling
Heating
Th1: Discharge thermistor
Th2: Discharge thermistor
Th3: Outdoor temperature thermistor
Th4: Defrost thermistor

Self-diagnosis Function

■ Error Indicator

- The self-diagnosis function of the air conditioner is used to identify any troubles that may exist.
- Refer to the table below to determine the error code associated with the LED signals given by the indoor air conditioner's display.
- If more than two problems occur simultaneously, one error code of most severity is displayed.
- After an error has occurred, if the error is fixed/cleared, the LED display representing the error code (shown in the table below) will also be cleared simultaneously.
- To operate the unit after the occurrence of an error code, it is best to power off the unit and then power on again.



Indoor Error

Error code	Description	MPS Variable	LED1	LED2	Indoor Status
00	No Error	●			ON
01	Indoor Room Thermistor Error	●	1 time ◑		OFF
02	Indoor In-Piping Error	●	2 times ◑		OFF
05	Communication Error between In and Out	●	5 times ◑		OFF
06	Indoor Out-Piping Error	●	6 times ◑		OFF
07	Differnt mode operation	●	7 times ◑		OFF
10	Indoor fan motor locked error	●		1 times ◑	OFF

Outdoor Error

Error code	Description	MPS Variable	LED1(Red)	LED2(Green)	Indoor Status
33	D-Pipe High(Normal)	●	3 times ◑	3 times ◑	OFF
44	Outdoor Air Thermistor Error(Open/Short)	●	4 times ◑	4 times ◑	OFF
45	Cond Pipe Thermistor Error(Open/Short)	●	4 times ◑	5 times ◑	OFF
47	Const. D-Pipe Thermistor Error(Open/Short)	●	4 times ◑	7 times ◑	OFF
51	Capcity Error(High/Low)	●	5 times ◑	1 times ◑	OFF

Cycle Troubleshooting Guide

Trouble analysis

1. Check temperature difference between intake and discharge air, as well as the operating current.

Temp. Difference

Operating Current

Temp. difference : approx. 0°C(0°F) Current : less than 80% of rated current	All of the refrigerant many have leaked out. Restriction in the refrigeration cycle.
Temp. difference : approx. 8°C(14.4°F) Current : less than 80% of rated current	Refrigerant leakage Clog of refrigeration cycle Defective compressor
Temp. difference : less than 8°C(14.4°F) Current : near the rated current	Excessive amount of refrigerant
Temp. difference : over 8°C(14.4°F)	Normal

Notice:
Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

Suction pressure (Compared with the normal value)	Temperature (Compared with the normal value)	Cause of Trouble	Description
Higher	High	Defective compressor	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant(Leakage)Clogging or Refrigerant Cycle Restrictions.	Current is low.

Notice:
1. The suction pressure is usually 4.5~6.0 kg/cm^2(64.0~85.34psi) at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrapping it with putty.

Electronic Parts Troubleshooting Guide

※ Refer to electronic contorol device drawing & schematic diagram.

Trouble 1 The Product doesn't operate at all.

Turn off the main power and wait until LED on outdoor PCB is off.

⇩

Turn on the main power again.

⇩

Is "Beeping" sound is made from the indoor unit?

NO ⇩

Check the voltage of power(AC208V/AC230V, 60Hz).

- The voltage of main power.
- The voltage applied to the unit.
- The connecting method of Indoor/Outdoor connecting cable (each color)
- The P.C.B. Ass'y
(Fuse, Noise Filter, Power Transformer, IC01D, IC02D, etc.)

YES ⇩

- Primarily, the operating condition of Micom is O.K.

⇩

- Check CN-DISP1

The operation check of the P.C.B. Ass'y

Procedure	Specification	Remedy
1) The input voltage of power transformer.	1) AC230V ± 30V : Check the rated voltage	1) Replace power transfomer.
2) The output voltage of power transformer.	2) 15V ± 1.5V	2) Replace power transfomer.
3) IC01D(7812)	3) DC12V	3) Replace IC01D.
4) IC02D(7805)	4) DC5V	4) Replace IC02D.
5) IC01A(KIA7036)	5) The voltage of micom pin 29 : DC4.5V↑	5) Replace IC01A.

Trouble 2 Product doesn't operate with the remote controller.

Turn on main power.

↓

While the compressor has been stopped, the compressor does not operate due to the designed 3 minute delay, which is a protective function anytime the compressor is stopped.

↓

When the compressor is stopped, the Indoor Fan is driven by a low speed.
At this point the fan speed is not controlled by the remote controller.
(When operated in the Sleeping Mode, the fan speed is set to the low speed as designed.)

↓

Caused by the remote controller.

↓

When the mark ( ) is displayed in LCD screen, replace battery.

↓

When the detect switch (double key) inside the remote controller door is fault, it is impossible to operate temperature regulating(▲ / ▼) and wind speed selecting.

↓

Check the Display PCB Ass'y

Caused by other parts except the remote controller

↓

Check the contact of CN-DISP 1 connector

↓

Check DISP PCB Ass'y
-Voltage between CN1 ① - ⑦ : DC +5V

↓

• Check receiver ass'y

Trouble 3 The Compressor/Outdoor Fan don't operate

Turn on the main power.

⇩

Operate Cooling Mode by setting the disired temperature of the remote controller to less than one of the Indoor temperature by 1°C(33.8°F) at least.

⇩

When in air circulation mode, compressor/outdoor fan is stopped.

⇩

Check that the sensor for Indoor temperature is attatched and as close as to the Heat Exchanger (Evaporator.)

⇩

When the sensor circuit for Indoor temperature and connector have a bad connection or are not engaged, Compressor/Outdoor fan is stopped.

- Check the related circuit of R01H(1K), R02H(1K), R03H(1K), R04H(1K), Micom(pin No.㊹, ㊺,㊻,㊼).
- Check that the Indoor temperature sensor is disconnected (about 10K at 25°C(77°F)).

⇩

Check the Relay(RY-PWR, RY-START) for driving Compressor.

- Check the voltage between brown and blue cable of terminal which connects to the Outdoor unit (About AC208V / 230V).
- Check the Outdoor PCB Assembly's relay circuit.

Check Point	Comp. ON	Comp. OFF
Between Micom(No. 50,51) and GND	DC 5V	DC 0V
Between IC01M(No. 10) and GND	DC 1V↓	DC 12V

⇩

Turn off main power.

⇩

Check the electrical wiring diagram of Outdoor side.
Check the open or short of connecting wires between Indoor and Outdoor.

Trouble 4 When indoor Fan does not operate.

When indoor Fan does not operate.

Does the voltage of each terminals of CN-MOTOR CONNECTOR in Indoor unit corresponds to values in the Table of page 70

Does the voltage of terminal of CN-DC/DC CONNECTOR in Indoor unit that corresponds to the values in the table of page 70

Does the voltage of terminal of CN-DC/DC CONNECTOR in Outdoor unit corresponds to the values in the table of page 70

Check the pattern and the condition of Indoor unit PCB Ass'y.

NO

Check the patterns and the conditions of outdoor unit PCB Assy's.

YES

Check the condition of connecting wires between Indoor and Outdoor unit.

Check connection condition of the CN-MOTOR CONNECTOR

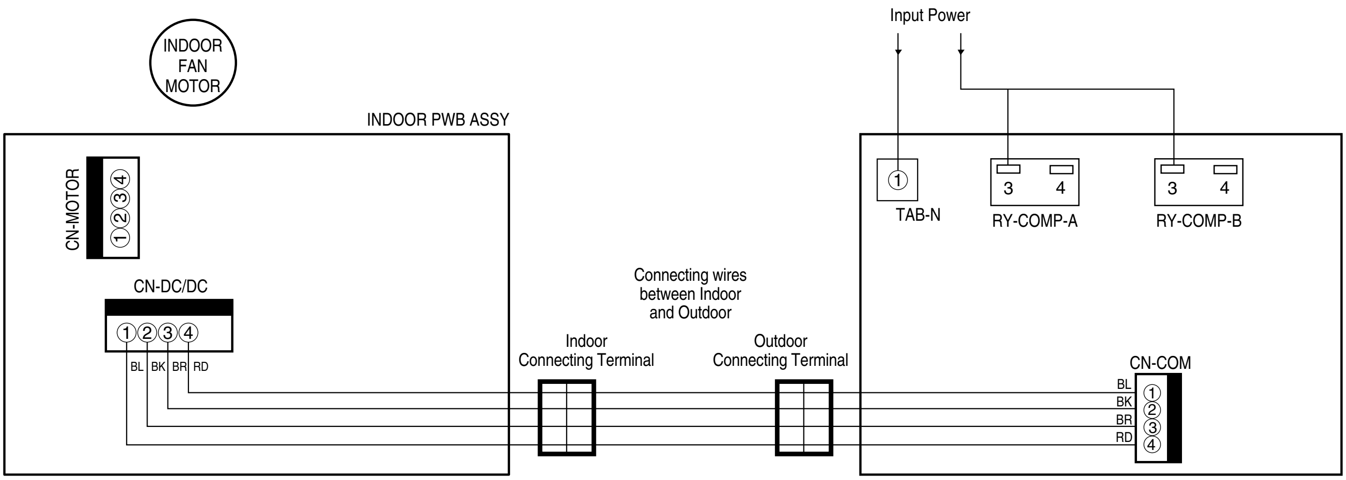
Check for any interference of Indoor Fan.

Check the motor of Indoor Fan

※ Indoor Fan may be off in the Soft Dry Mode(change to the Cooling Operation Mode).

※ Indoor Fan is off when Indoor pipe(coil) termperature is lower than 79°F.
(At that time, the defrost indicator is turn on.)

Voltage of Connectors according to Indoor Fan Speed



	No. of pins		DC Voltage(±10%)				
	+	–	S-Hi	Hi	Med	Low	Off
INDOOR CN-MOTOR	4	3	35.5	32.96	25.17	17.28	0
	2	3	11.97	11.97	11.97	11.97	11.97
INDOOR CN-DC/DC	4	2	35.5	32.96	25.17	17.28	0
	3	2	15.87	15.87	15.87	15.87	15.87
OUTDOOR CN-COM	4	2	35.5	32.96	25.17	17.28	0
	3	2	15.87	15.87	15.87	15.87	15.87

Trouble 5 When Vertical Louver does not operate.

- Confirm that the Vertical Louver is normally geared with the shaft of Stepping Motor.
- If the regular torque is detected when rotating the Vertical Louver with hands ⇒ Normal

⇩

- Check the connection condition of CN-UP/DOWN Connector
- Check the soldering condition(on PCB) of CN-UP/DOWN Connector

⇩

Check the operating circuit of the Vertical Louver

- Confirm that there is DC +12V between pin②(RED) of CN-UP/DOWN and GND.
- Confirm that there is a soldering short at following terminals.
  - Between ⑥⓪, ⑥①, ⑥② and ⑥③ of MICOM
  - Between ②, ③, ④ and ⑤ of IC01M
  - Between ⑫, ⑬, ⑭, ⑮ of IC01M
  - Between ①, ②, ③, ④ and ⑤ of CN-UP/DOWN

⇩

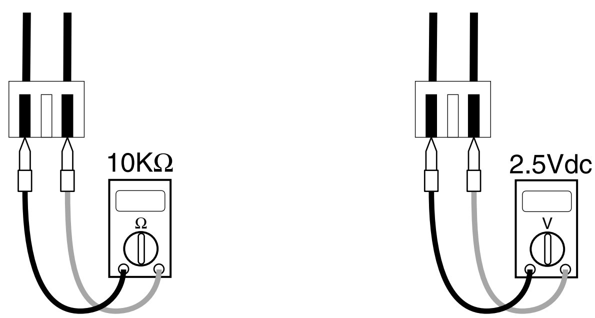
If there are no problems after above checks

- Confirm if the assembly parts are catching and interfering in the rotation of the Vertical Louver

Error Code

■ **Trouble Shooting**

Error code	Description	Cause of error	Check point & Normal condition
01	**Indoor air sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 10KΩ / at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
02	**Indoor inlet pipe sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 5KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
06	**Indoor outlet pipe sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 5KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)



Check the resistance / voltage

❑ Check Point

1. Unplug the sensor on Indoor unit PCB.
2. Estimate the resistance of each sensor
3. If the resistance of the sensor is 10KΩ/5KΩ at 25°C(77°F), then sensor is normal
4. If the resistance of the sensor is 0 KΩ or ∞, then sensor is abnormal. ➔ Change the sensor.
5. Plug the sensor onto the Indoor unit PCB and Power ON.
6. Estimate the voltage of each sensor.
7. If the voltage of the sensor is 2.5Vdc / at 25°C(77°F), then sensor is normal.
8. If the resistance of the sensor is 0 or 5Vdc, then sensor is abnormal. ➔ Repair or Change the PCB

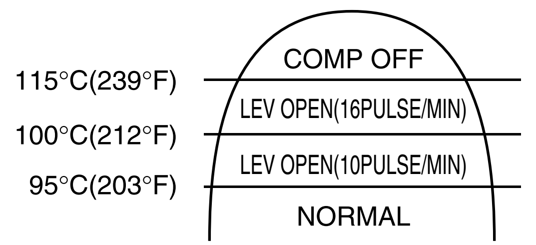
Error code	Description	Cause of error	Check point & Normal condition
05 / 53	**Communication (Indoor ➔ Outdoor)**	• Poor Communication	• Power input AC 230V.(Outdoor, Indoor) • The connector for transmission is disconnected. • The connecting wires are misconnected. • The GND 1,2 is not connected at main GND. • The communication line is shorted at GND. • Transmission circuit of outdoor PCB is abnormal. • Transmission circuit of indoor PCB is abnormal.

❑ Check Point

1. Check the input power AC 230V.(Outdoor, Indoor)
2. Check that the communication wires are correctly connected.
   ➔ Adjust the connection of wire
   ➔ Confirm the "Live", "Neutral“ wires.
3. Check the resistance between communication line and GND.(Normal : Over 2MΩ)
4. Check the connector for communication is correctly connected.
5. Check the connection of GND1, GND2, and main GND.
6. If one indoor unit is operating normally, outdoor PCB has no problem.
   ➔ Check the other indoor unit.

* CH05 is displayed at indoor unit, CH53 is displayed at outdoor unit.

Error code	Description	Cause of error	Check point & Normal condition
33	**D-Pipe Temp. High**	• Discharge sensor temp. high	• Check the discharge pipe sensor. • Check the install condition for over load. • Check for leakage of refrigerent. • Check is the Service Valve (SVC V/V) is open.



❑ Check Point

1. Check the install condition for over load.
2. Check is the Service Valve (SVC V/V) is open.
3. Check for leakage of refrigerent.
4. Check the constant compressor.

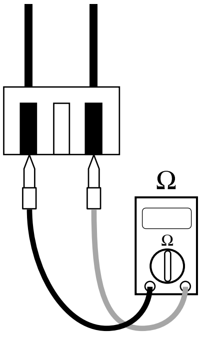
Error code	Description	Cause of error	Check point & Normal condition
51	**Capacitor error**	• Over Capacitor com-bination	• Check the indoor unit capacity. • Check the combination table

❑ Check Point

1. Check the indoor unit capacity.
2. Check the combination table.

➔ single cycle has no error for over capacity.

Error code	Description	Cause of error	Check point & Normal condition
44	**Outdoor air sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 10KΩ / at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
45	**Condensor pipe sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 5KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 2.5Vdc / at 25°C(77°F) (plugged)
47	**D-Pipe sensor**	• Open / Short • Soldered poorly • Internal circuit error	Normal resistor : 200KΩ/ at 25°C(77°F) (Unplugged) Normal voltage : 4.5Vdc / at 25°C(77°F) (plugged)

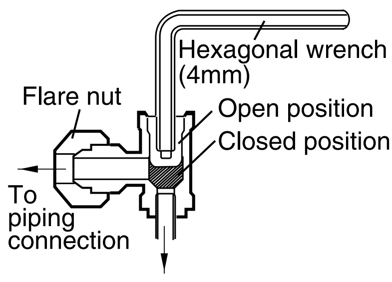
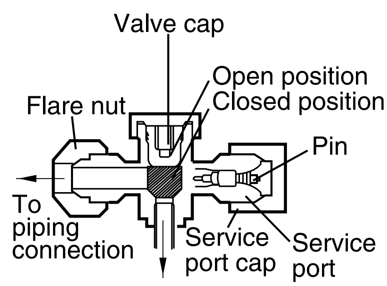


Check the resistance

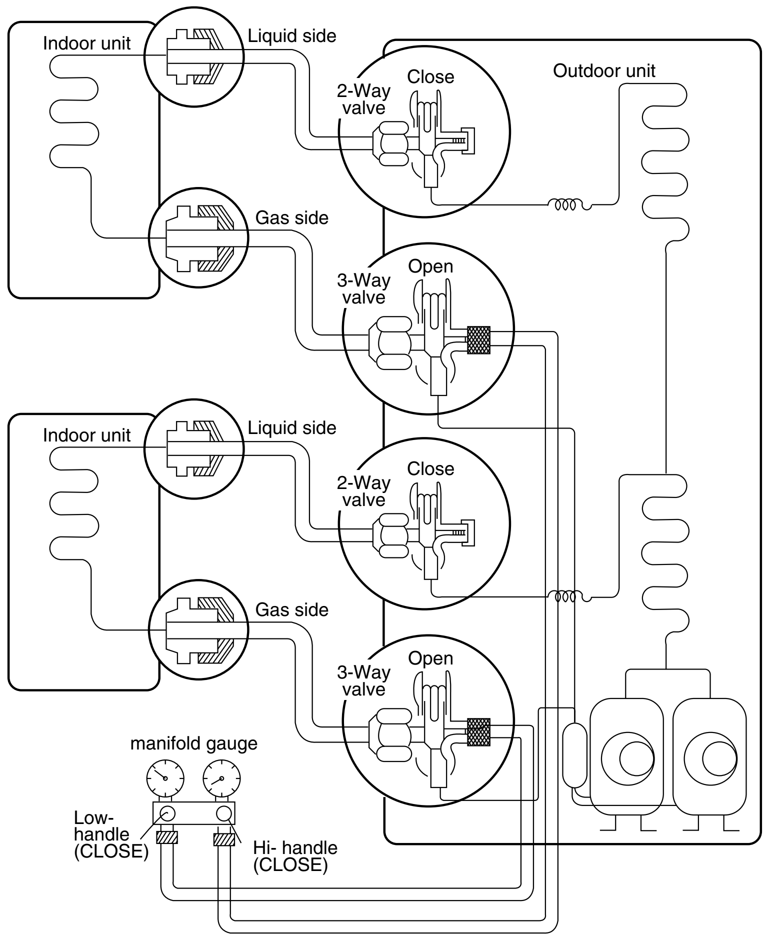
❑ Check Point

1. Estimate the resistance of each sensor.(Unplugged)
2. Estimate the voltage of each sensor.(Plugged)
3. If the resistance is 0V or 5Vdc, then sensor is abnormal

2-way, 3-way Valve

	2-way Valve (Liguid Side)	3-way Valve (Gas Side)	
			
Control Mechanism	Shaft position	Shaft position	Service port
Factory Setting	Closed (with valve cap)	Closed (with valve cap)	Closed (with cap)
1. Air purging (Installation)	Open (counter-clockwise)	Closed (clockwise)	Open (push-pin or with vacuum pump)
Operation	Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2. Pumping down (Transfering)	Closed (clockwise)	Open (counter-clockwise)	Open (connected manifold gauge)
3. Evacuation (Servicing)	Open	Open	Open (with charging cylinder)
4. Gas charging (Servicing)	Open	Open	Open (with charging cylinder)
5. Pressure check (Servicing)	Open	Open	Open (with charging cylinder)
6. Gas releasing (Servicing)	Open	Open	Open (with charging cylinder)

(1) Pumping down



• Procedure

1. **Confirm that both the gas side and liquid side valves are set to the open position.**
   - Remove the valve stem caps and confirm that the valve stems are in the raised position.
   - Be sure to use a hexagonal wrench to operate the valve stems.
2. **Operate the unit for 10 to 15 minutes.**
3. **Stop operation and wait for 3 minutes, then connect the manifold gauge to the service port of the gas side valve.**
   - Connect the hose of the gauge with the push pin to the service port.
4. **Air purging of the charge hose.**
   - Open the Low-handle valve on the gauge slightly to air purge from the hose.
5. **Set the liquid side valve to the closed position.**
6. **Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kgf/cm²(14.22psi).**
7. **Immediately set the gas side valve to the closed position.**
   - Do this quickly so that the gauge ends up indicating 1kg/cm²(14.22psi).
8. **Disconnect the charge set, and replace the liquid side and gas side valve caps and the service port nut.**
   - Use torque wrench to tighten the service port nut to a torque as indicated below.

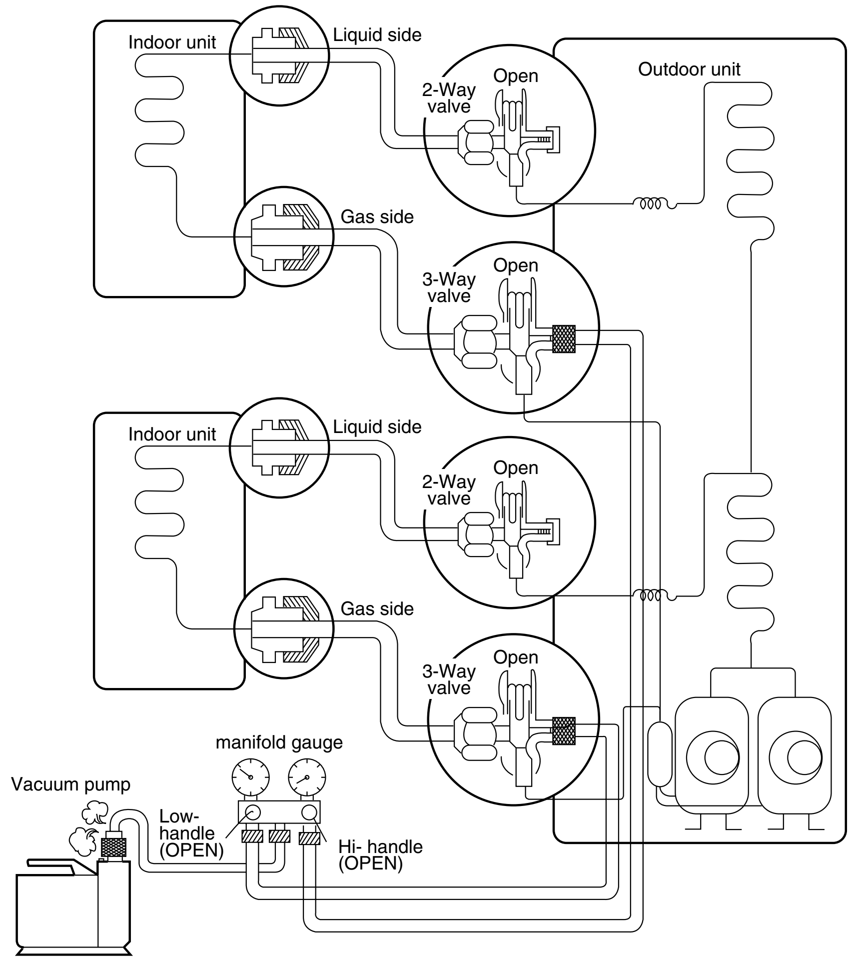
Outside diameter		Turque	
mm	inch	kg·m	lbf·in
Ø6.35	1/4	1.8	156.2
Ø9.52	3/8	4.2	364.5
Ø12.7	1/2	5.5	477.4

   - Be sure to check for gas leakage.

• Be sure not to short the pressure switch S/W, otherwise if the low pressure switch S/W detects low pressure it will stop the compressor.

(2) Evacuation

(All the refrigerant leaked)

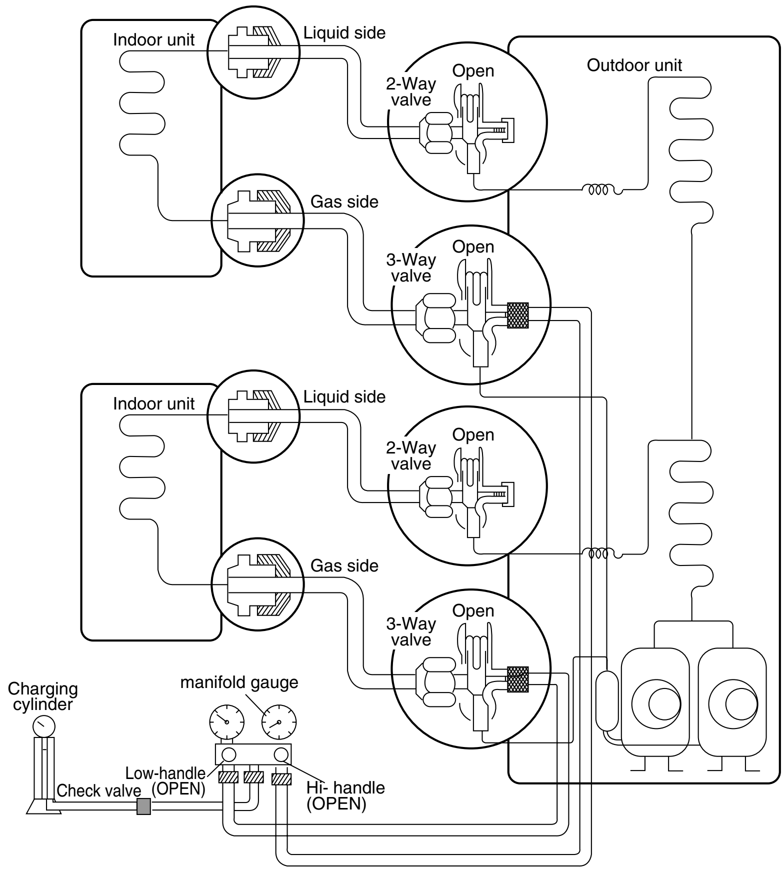


• Procedure

1. **Confirm that both the liguid side valve and gas side valve are set to the opened position.**
2. **Connect the vaccum pump to the center hose of the manifold gauge.**
3. **Connect the service port of the gas side valve to the low side of the gauge.**
4. **Evacuate for approximately one hour.**
   - Confirm that the gauge needle has moved toward-76 cmHg (vacuum of 4 mmHg or less).
5. **Close the Low handle of the gauge, turn off the vacuum pump and confirm that the gauge needle does not move(approximately 5 minutes after turning off the vacuum pump).**
6. **Disconnect the charge hose from the vacuum pump.**
   - If the vacuum pump oil becomes dirty or deplet-ed, replenish as needed.
7. **Replace the valve and service port caps.**

(3) Gas Charging

(After Evacuation)



• Procedure

1. Connect the gauge to the charging cylinder.
- Connect the charge hose, which you disconnected from the vacuum pump, to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

2. Purge the air from the charge hose.
- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. The procedure is the same if using a gas cylinder.

3. Open the low handle on the gauge and charge the system with liquid refrigerant.
- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g(5.29oz) each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure(pumping down-pin).

4. Immediately disconnect the charge hose from the gas side valve's service port.

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

- Stopping part way will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

5. Replace the valve stem nuts and the service port nut.
- Use torque wrench to tighten the service port nut to a torque as indicated below.

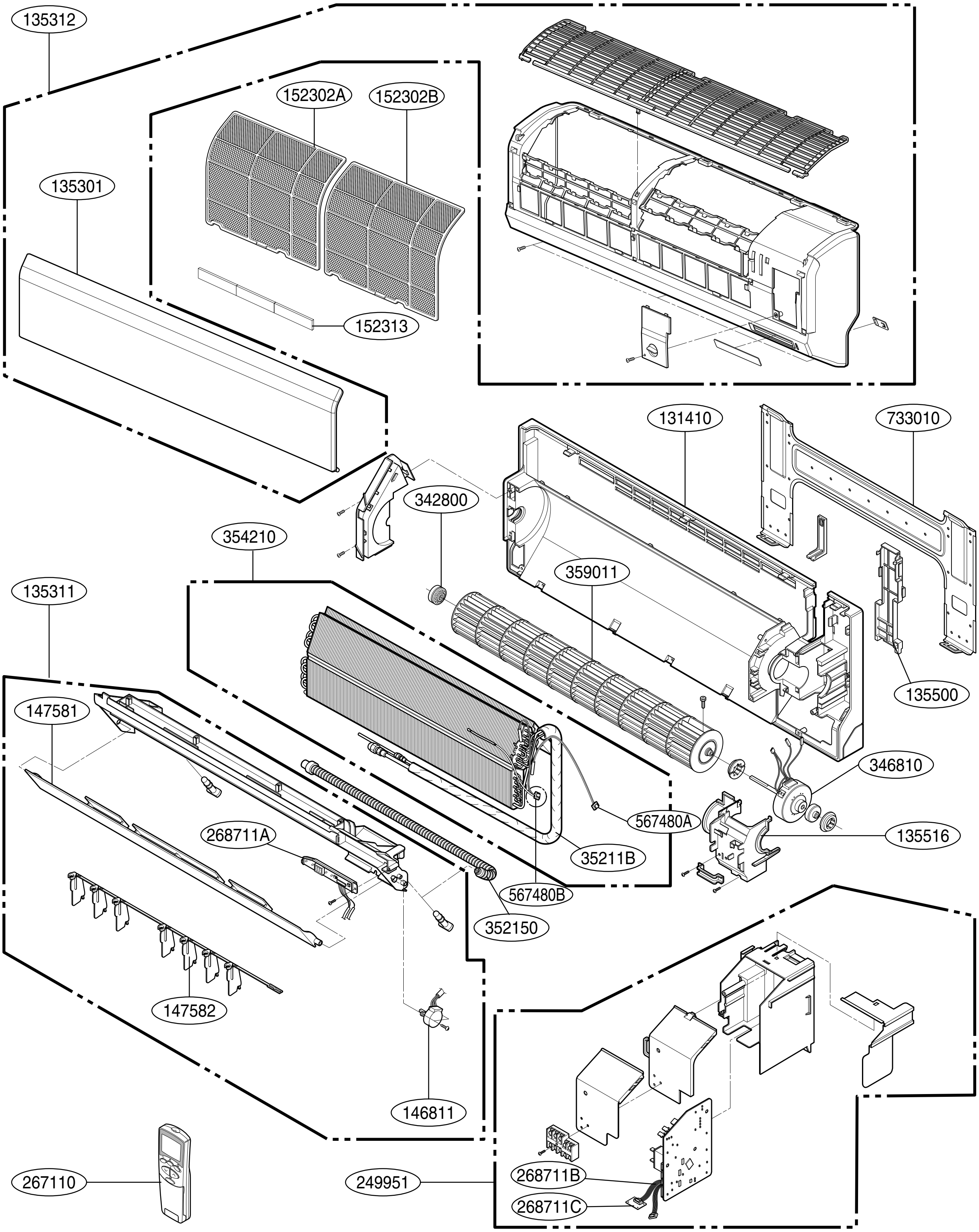
Outside diameter		Turque	
mm	inch	kg·m	lbf·in
Ø6.35	1/4	1.8	156.2
Ø9.52	3/8	4.2	364.5
Ø12.7	1/2	5.5	477.4

- Be sure to check for gas leakage.

Exploded View

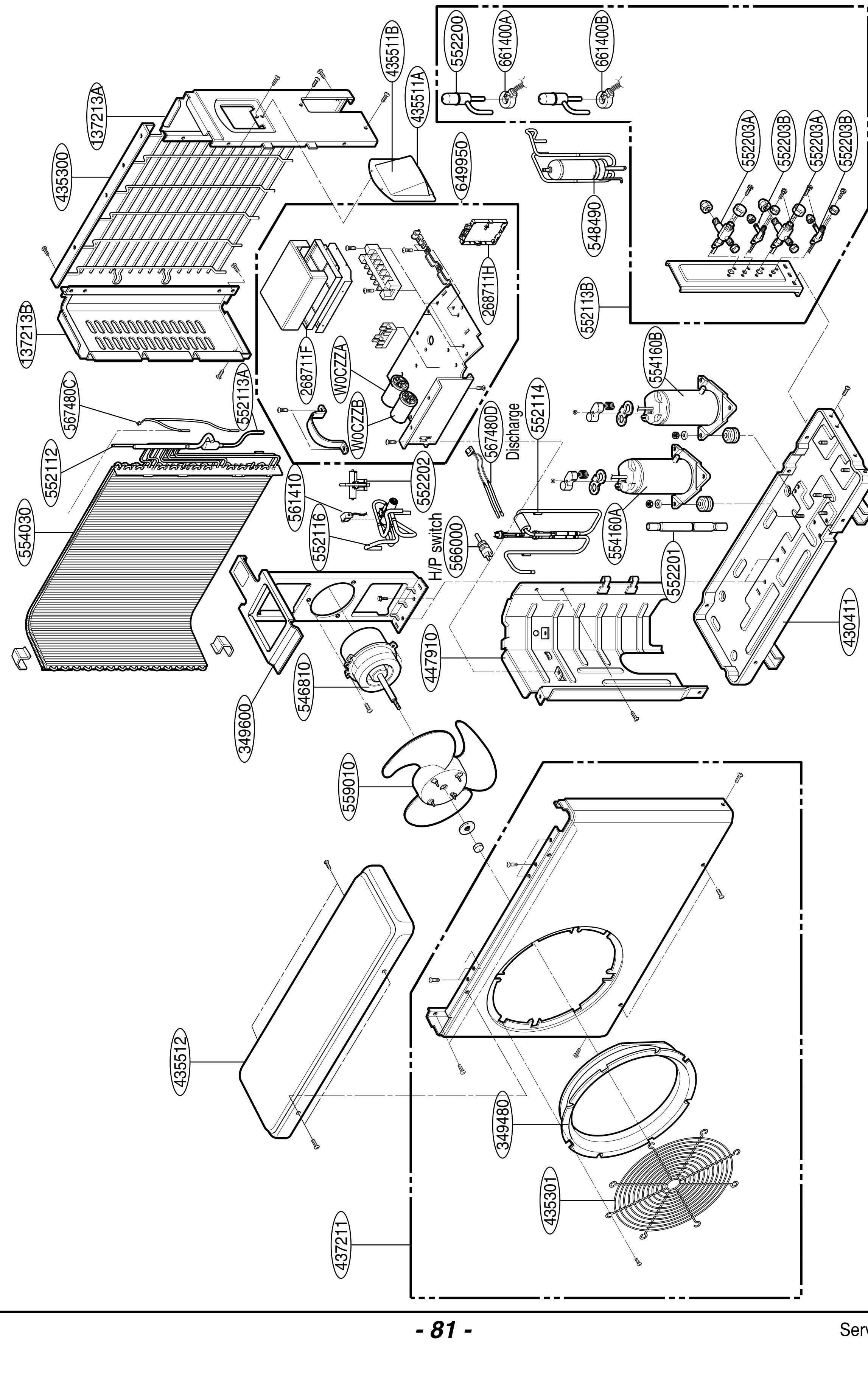
Indoor Unit

Model : B-MMC09FA-1, B-MMH09FA-1, B-MMC12FA-1, B-MMH12FA-1

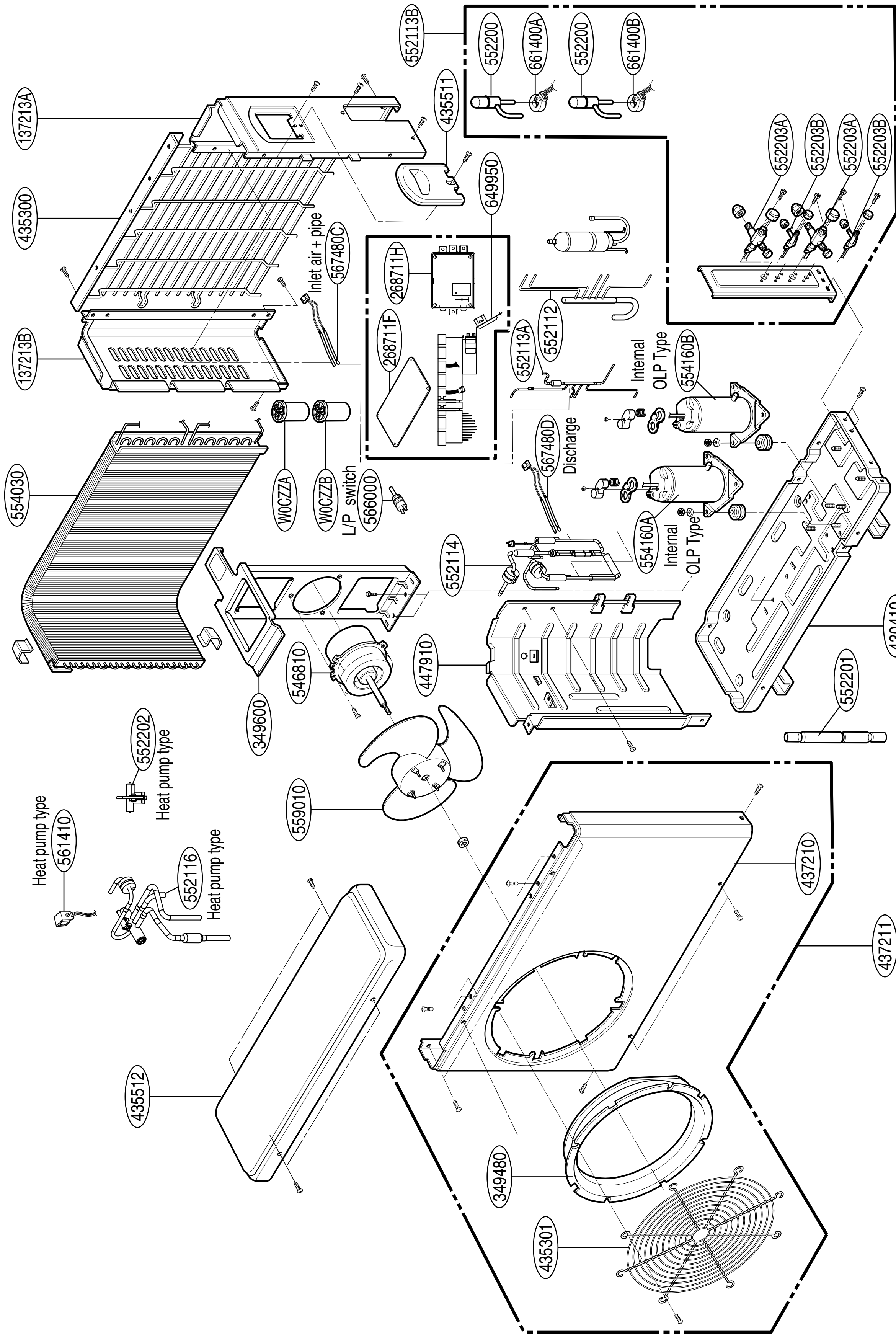


Outdoor Unit

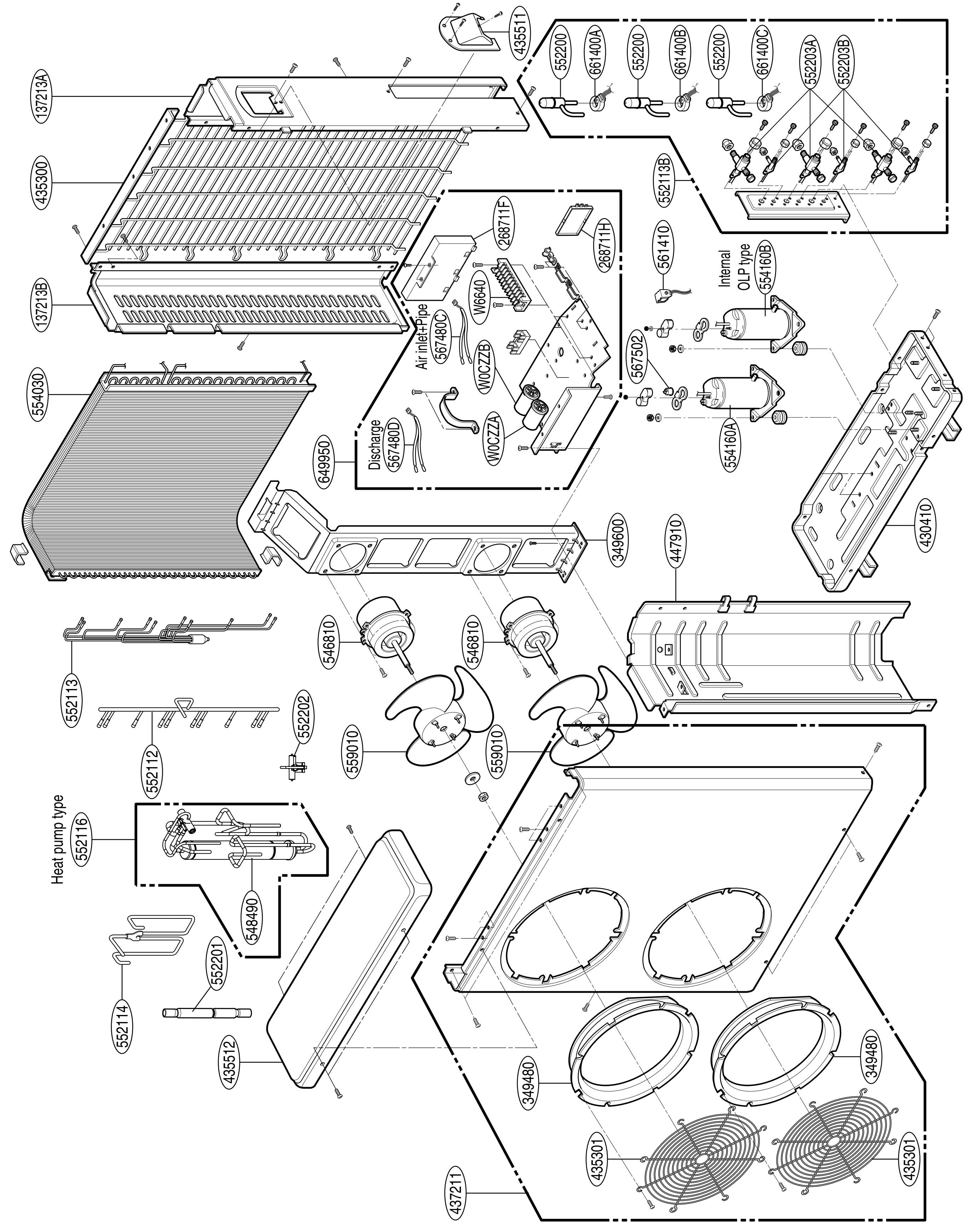
Model : A-MMC18FA-1, A-MMH18FA-1



Model : A-MMC24FA-1, A-MMH24FA-1



Model : A-MMC36FA-1, A-MMH36FA-1



HEAT CONTROLLER, INC.

1900 WELLWORTH AVENUE • JACKSON, MICHIGAN 49203

THE QUALITY LEADER IN CONDITIONING AIR

P/No.:3828A20390X **08/06/2008**